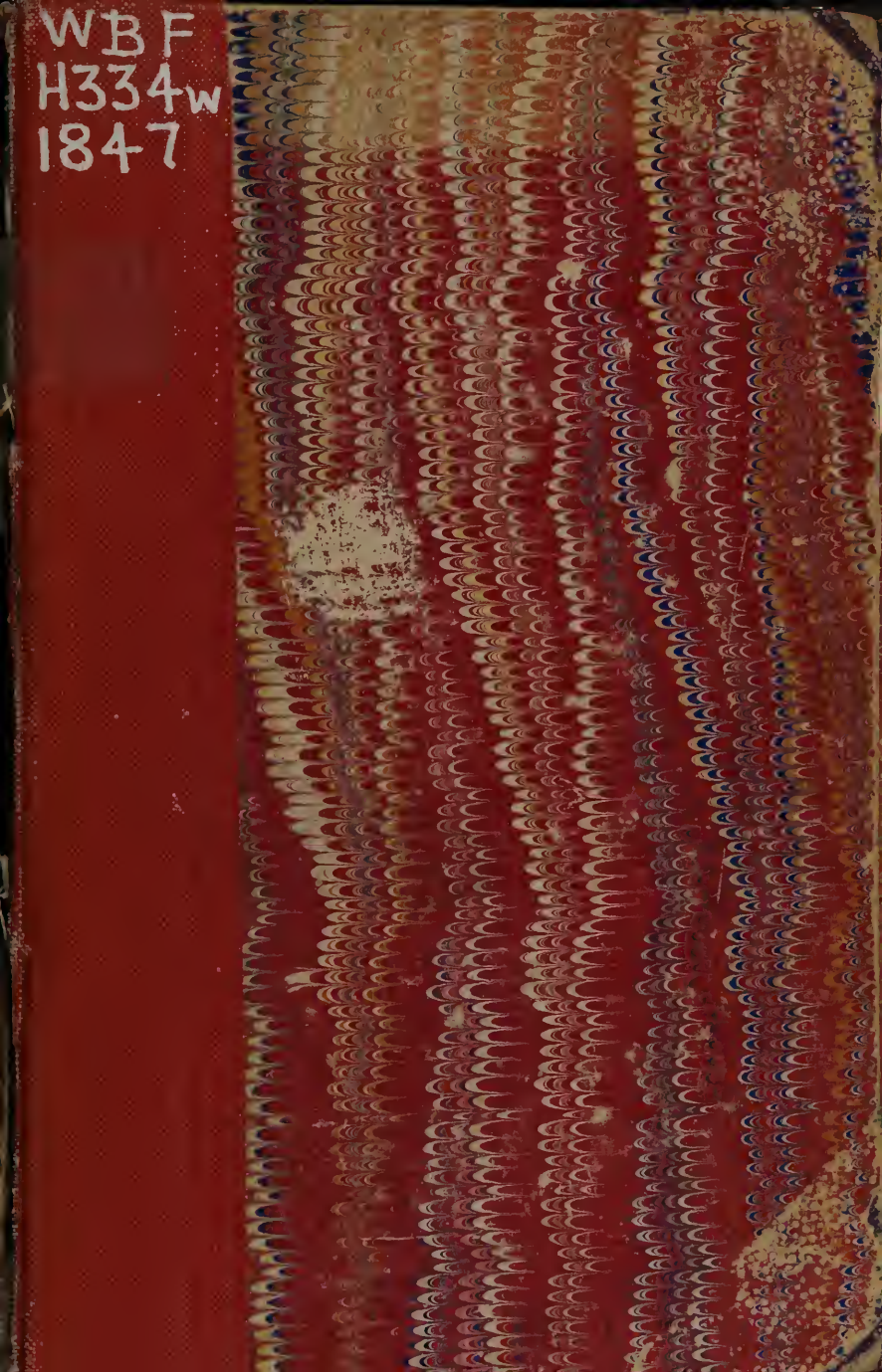

AN ESSAY ON WATER.

WATER

VERSUS

HYDROPATHY;

OR,

AN ESSAY ON WATER,

AND

ITS TRUE RELATIONS TO MEDICINE.

BY

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Ἡ δὲ τεχνὴ μακρή.

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PREFACE.

The following essay has been printed, in the hope of interesting and perhaps being useful to some, who are not deterred from placing a high value upon simple means, merely because of their simplicity; still being, with reason, opposed to any *exclusive* reliance upon such means.

To the really practical medical man, the "uses of water" comprise a magazine of his most serviceable resources; and to the student, they should form an elementary part, almost a department of their own, in his early studies. The extreme of ignorant pretenders, or more knowing impostors, forms no good argument against these established weapons of art;

but rather urges on us imperatively their scientific investigation.

At a time when Hydropathy must be ranked amongst the reigning medical delusions, it becomes particularly profitable to inquire what are the positive and proper uses of water in medicine, and what is the degree of their estimation and appreciation by the profession. It has appeared to me that the best way of opposing the error of Preissnitz, would be fairly to expose, without extenuation, the *real* interest and utility of water, with the limitations which experience and authority have defined. This has been a prominent object in the succeeding pages.

Pennsylvania Hospital, 2mo. 1847.

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WATER

VERSUS

HYDROPATHY.

CHAPTER I.

General remarks on Water—Its properties—Physiological actions—Action of water *as a substance.*

The full developement of the subject proposed in our title, would occupy a large volume; but as the detail essential in treating of a new and little known topic is entirely unnecessary here, we shall merely call attention to those points, which may give rise to the most interesting remark.

Any system of medical treatment, based upon the actions of but *one* agent, must be in theory and practice wrong; and therefore what is called Hydropathy *must* be entirely a false system. And yet the assertion may be hazarded, that as no element is more essential to the body in health, so none may be applied to so many therapeutic uses, as water. This is not at all contradicted by the assertion, that its effects are

never sufficiently energetic in any mode of application for it to be depended upon alone in any violent disease. If mere hygienic regulations, regimen and diet, are of vast importance in the prevention and cure of dangerous, nay, of all diseases, how can great value be denied to an agent which in some form is useful in our attack upon almost every affection, as palliative, and often as a really curative means? The sum of human happiness is diminished as much by lesser, and more frequent, as by greater ills; few of the greater arise indeed, except as consequences of the less, when neglected, or beyond our power to remove. And in some applications, water is a means of *very great* energy, for use or for abuse. The design of this essay is to oppose the *latter*, by a sketch of the authorized limits of the former.

We might infer *a priori* the importance of water as related to hygiene and therapeutics, from the facts of what may be called its natural history. Constituting in inorganic matter, three-fourths of the surface of the globe;* and in man three-fourths of his whole

* An interesting subject is the *constant supply* of water to its vast accumulations and expenditures, as lakes, rivers, and such masses as the great Niagara Falls, &c. The theory of central heat is thus applied by a writer in the Polytechnic Magazine to the explanation of *hot springs*, as well as to that of earthquakes, as similarly caused. "We well know," says he, "the ease with which water descends between the strata of any rock,—and if it arrives, as it may very easily do, between the secondary strata to the point even where water boils, namely less than half a mile, steam will be generated. This will

body. The blood containing according to Berzelius $\frac{903}{1000}$, and the lymph and all the secretions nearly the same proportion, its presence is indispensable, so far as we know, to the existence of all living beings. Spallanzani and others make exception in the case of mosses and some infusorial animals, but it would certainly be most difficult to prove their assertion. "Thales, Paracelsus, Van Helmont and Boyle, reckoned water the stamen of all things." Sir I.

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separate the strata a little farther, more water will sink down," &c. "Hot springs may be explained on the same principle, only the water does not arrive at so great a depth before it is again returned to the surface." In an essay by T. Jameson (1788), an analogous idea is suggested, with regard to the spring waters of Bath. It is interesting also to find in one of the Greek authors the following passage; "οσων εισιν αι πηγαι εκ πετρεων . . . . . η ειτε οχου θερμα υδατα εστιν, η σιδηρος γινεται, η χαλκος, η . . . . . ταυτα . . . . . παντα υπο βιης γινον του θερμου." But this hypothesis does not seem to me necessary to explain the supply of great lakes, or of Niagara. An analogy to the process, by means of rain, and springs and streams joining together, is furnished by the circulation of living beings. At each contraction of the heart of a whale, 10 or 15 gallons pass out through an aorta a foot in diameter: yet all this is supplied by the minute capillary circulation. Whewell (Bridgewater treatise) considers the other theory to be erroneous so far as regards the supply of springs from the sea, or subterranean reservoirs. The only argument, however, by which he sustains this assertion, is drawn from calculations made by Dalton, (Manchester Memoirs, v. 357) of the amount of rain, evaporation, &c., in England; without mentioning, at least, if considering, those elements of the discussion arising from the immensity of our American Lakes, the Niagara cataract, and from hot springs, &c.

Newton said, "that all beasts, birds, fishes, insects, trees and vegetables, grow out of water, and by putrefaction return to water again."* The connexion between vitality and moisture, led the ancients to suppose that water was the parent of every thing possessed of life. This notion is said to have been derived from a statement made by Moses (Genesis i. 20.) It is taught in the Koran, and has been embraced by Milton (Paradise Lost, book vii. line 234). Apart from such fancies, *must* not an element occupying so large a space in organic life be, in the hand of remedial art, assisting not resisting or supplanting nature, an agent of the very greatest value?

There is a remarkable contrast between the different attributes of water. In its sensible properties there is scarcely anything more strictly negative, and yet some of its qualities are strikingly and usefully concerned in the grand operations of Nature—as the slowness with which it conducts, and its high capacity for heat, in rendering the ocean with its rivers, &c., a grand moderator of temperature, and its high power of refracting light, in producing the rainbow beauties of atmospheric scenery. Of electricity, ice is a non-conductor, but water conducts it, although imperfectly. The experimenter finds this to his cost in damp weather, in the difficulty of then insulating his charged reservoirs. And is it not probable that

* Pereira.

similar phenomena are far more extensive than are usually noticed? that what is called the influence "of the weather" is to a considerable degree owing to the conducting power of aqueous vapour, in many cases actually depleting the body of its usual stimulus of electricity?* A farther consideration of this subject would be here out of place.

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* There are other instances in which the action of this conducting power may be suspected: *e. g.* the *soothing*, *lulling*, tranquillizing influence of the warm, or tepid *bath.* It is an interesting topic. However averse we may be to the fancy that "electricity is life," or that electricity or galvanism, is the nervous fluid; still we cannot, I think, resist the facts which show that not only like all other bodies, but in a greater degree than any other body, the animal frame contains and is influenced by this principle. Does it follow at all, because it is thought there must be a vital force, and still more certainly an intellectual power governing all, that, contrary to all analogy, their existence should disprove that of electricity, or other imponderable agents in the body, or even their great importance in the economy? The effects of lightning, or if not these, the minor peculiar effects of electricity and galvanism on the body, living or apparently dead, and to my mind many of the phenomena of *pain* (for instance the effect often observed of simple contact of an external body in relieving local pain, the resemblance of which to the discharge of an accumulated imponderable fluid, however fanciful it may appear, has often forced itself upon my mind) as well as of pleasurable sensation, and finally the influence of the weather upon our bodily feelings and condition, all support this view, without giving the slightest reason for supposing that electricity *is life*, or even is the "nervous fluid." In damp weather, or during the prevalence of east and northeast winds, many persons suffer from lassitude and weakness, while one whose nervous forces were *redundant* has told me that he "always felt better at the time of a northeasterly storm." Some distinguished

Being constituted of two of the most active among the simple elements, the formation and decomposition

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authorities have gone very far in their opinions on this subject; as Linnæus, who thought that the function of the lungs was to secrete electricity from the atmosphere: also Hunter, Haller, and Abernethy, (see Abernethy on Hunter's theory, p. 68.) The best resumé of the real knowledge, yet attained about it, is, as far as I have seen, in Holland's Medical Notes and Reflexions, p. 591–596. He justly concludes "that we are not yet justified in laying down any definite dogma on the subject." The amount of investigation in regard to it is daily increasing. As one instance of this, we have account of a paper received at the session of the Paris Academy, June 10th, 1844, in which they endeavour to demonstrate the existence of a fluid, being neither that of electricity nor magnetism, but intermediate, and having exclusive reference to the nerves. The authors were Thilorier and Lafontaine. Also a lecture recently, by Professor Keenan, maintaining that the body is an electro-galvanic apparatus, and the view of T. Wharton Jones, (London Med. Gaz.) that muscular fibre consists of a series of electro-magnetic disks; besides the later investigations of Baron Reichenbach. It would seem, as Dr. Holland remarks, that we must be on the eve of some great discovery in psycho-physiology. There needs but the mind of a Newton to generalize what is already known. But, however this may be with scientific men, in the common practical opinion of the mass it is different. Electricity, men seem to think, is a something existing only in the clouds, in lecture-rooms and in books; that agent which puts out life in a moment, which destroys fleets and cities, whose equilibrium the mere combing of one's head, or the pulling off of a garment visibly disturbs, and a little rubbing together of silk and glass most palpably, can have no effect in *common* times on the body. And it is of no consequence, whether you attempt to provide against its changes or not. Flannel is worn principally, because it is a slow conductor of heat; in fact this is the alleged ground in the selection of all clothing; but can it be, that electricity is so idle in the vicissitudes of nature as not to require a thought? Its changes

of water attend many chemical processes, natural and artificial. Some of its relations would appear to

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are often more sudden, vivid and impressive, than those of caloric; having these, and indeed all the four ancient principles, fire, air, earth and water, often immediately under its control. Should this Catiline among the elements be alone without its guard? The practical inference from this reasoning is, that it is at least well worthy of consideration, whether a more decided non-conductor of electricity than flannel, would not be a greater protection, and possess positive advantages. Such a material is silk. A physician who prefers it for under-garment to any thing else, has found in its results with others, no reason to regret having recommended it. But flannel is thought also to have its advantages. It is I believe generally considered warmer, and a greater defence against changes of temperature than silk; but this must be simply because its cheapness allows of a greater thickness and quantity than is usual of silk, for experiments as old as Count Rumford have proved that the latter is the slower conductor. A real advantage of flannel however to many is, the stimulus it affords to the skin, sometimes acting as an efficient revulsive. It certainly produces much more perspiration than a silk garment. This in some cases is desirable, but in others its excess is debilitating, and more than that occasionally exposes one to catarrh, &c., like any other dampness continued about the body, and on a reduction of temperature. After a trial of each on my own body, I cannot but think, that any one whose exercise is much varied, so as to increase at times his heat considerably, followed by rest and consequent cooling, is much more apt to take cold under the excessive perspiration caused by flannel, than with that much more moderate, when silk is worn next the skin. The *stimulus* of flannel I know opposes such dangers; but this must be almost inactive or absent during the *rest* which so naturally succeeds heating exertion. The qualities of the perspiratory fluid are also protective; but *excess* must *dilute* them as diuresis does those of the urine. With those who use little motion, this objection of course does not exist. But are not all advantages gained by those who use a *combi-*

justify the name of hydric acid suggested by Berzelius; but entirely otherwise is the fact of its *taking the place* of regular bases, as in the monobasic, bibasic, and tribasic phosphates, arseniates, &c. The theory of acids recently proposed by Liebig, (Lancet, July 26th, 1844,) in which hydrogen is made the element on which the saturating, or salt-forming

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nation of both these materials for under-garments? Neuralgias and rheumatisms,—the former of which at least, and the cases partaking of the nature of both, it seems to me probable are in some way dependent, not only on the temperature but on the electrical state of the atmosphere, and varying conduction by watery vapour, causing accumulations or deficiencies of electrical excitement in the body,—would by this means be most effectually avoided. A fabric somewhat resembling this combination is found in nature, in the alpacha of South America: which has a hair, according to Dr. Hamilton of London, "fitted for the production of textile fabrics differing from all others; occupying a *medium* position *between wool and silk*. The Indians of South American mountains manufacture nearly all their clothing from it." The fact is, that the actions of the imponderable agents heat, light, electricity, galvanism, magnetism, are always united and blended together. Electrical changes evolve heat, and modifications of heat, even unequal distribution of it in the same body, produce currents of electricity or galvanism. In attempting therefore to ward off the effects of one, it is unphilosophical not to regard the relations and laws of all the others of these agents. Attention to those of electricity is now becoming more minute; and without regard to this principle, the use of silk next the skin is *beginning* to be somewhat common; but a much greater universality in the employment of a combination of it with flannel in winter by the healthy, and the whole year round by the feeble and susceptible, would be far better than Marshall Hall's "alcoholic lotion," and would amply compensate for any little difference in expense.

power depends, would give a new appearance to the importance of a certain portion of water to the existence of many acids.

It is somewhat curious that the atomic or combining number of water is smaller than that of any other chemical compound known, except dicarburetted hydrogen. Although the number for silicon is less than 8, yet it does not afford an exception, as it does not form any definite compound (as yet stated) with hydrogen; the amount of the gas noticed by Berzelius in silicon before combustion, not having been found to present a fixed proportion. How far this atomic constitution may be connected with the properties of water, it would be unphilosophical to speculate. But that some such connexion exists has been already rendered probable, and will we may hope, at some future day, be fixed above the vacillations of theory, to which the whole subject as yet remains exposed.

Simple as the action of water upon the human system apparently is, few subjects with such facility and so little advantage provoke disputes among investigators. Sedative, tonic, stimulant and twenty other titles have been given it, not because of uncertainty in the subject itself, but because *these names*, like all classifications in Materia Medica, are to a degree uncertain and arbitrary; and because in its different applications and under different circumstances they all do properly belong to it. May not

its various actions be best thus analyzed? 1. Its own proper effect as a substance, apart from its power as a vehicle for other bodies, temperature, &c. 2. Its effects as a conducting medium, as in increasing or decreasing heat, and in rendering it latent in changing from the solid to the liquid, or from the liquid to the gaseous form, as in evaporation. Some forms of the *douche* add also the shock produced by falling from a height. To the foregoing effects with regard to heat must there not also be conjoined some resulting from the power of water to conduct electricity?

3. The action of water impregnated with various substances. This classification of course is only a mental one; practically we can make little separation except so far as relates to the last of these heads, which may be considered apart from the others. With the former two this essay is principally concerned. When pure, of the temperature of the body, and applied without force, the *sedative* action of water, internally and externally, was abundantly proved by the experiments of Dr. W. F. Edwards, as well as by those of Nasse, Humboldt, and Pierson, mentioned in Dr. Edwards's book, "Sur les agens physiques." There is considerable interest in these experiments,* as well as in those of Dr. Davy upon the

* Among others Dr. Edwards relates the trial of the different vivifying powers of water and air, as exemplified in the batrachian reptiles. "The heart and bulb of the aorta were removed from 12 frogs

various tissues after death. A detailed account of the results* obtained by the latter is given in his Physio-

(R. esculenta and R. temporaria), 6 of which were placed in water deprived of air, and 6 in air. Those in water lived two hours, and those in the air three." It was found by experiment that temperature had a powerful influence; in frogs the duration of life being inversely as the elevation of the heat. The aeration or non-aeration of the water was another important item; 6 frogs in boiled water lived from 3 hours and 40 minutes to 5 hours and 50 minutes; 6 in aerated water lived from 6 hours and 43 minutes to 10 hours and 40 minutes. Experiments proved that it was not through the lungs that these animals received the influence of the air contained in the water.

* They are interesting, as aiding us somewhat in reflecting on the probable effects of the same substance on the body and its parts during life. He found muscular substance, as of the heart, to lose its solidity rapidly, the ventricle more so than the auricle; in which particular the tongue and most of the voluntary muscles resembled the ventricle, while others the auricle,—as the muscular coat of the primæ viæ, and especially of the rectum, and of the urinary bladder. The brain, he states, rapidly became soft. The liver and kidney were soon reduced to a soft mass. The substance of the lungs softened pretty rapidly; where there were tubercles the alteration was quickest, and commenced with the tubercles. The arteries underwent change very slowly. The vena cava gradually softened, wasting irregularly into holes, and finally into shreds and patches. The thoracic duct slowly in a similar manner. During the first eight or nine days there was no distinct softening or change in the stomach; on the forty-fifth day it was in progress in all its tissues; on the seventy-second disintegration was nearly completed. In the intestines the same change took place still more slowly. Gall-bladder and biliary ducts were tardy in alteration. Tendon and bone very slow. Synovial membrane had principally disappeared in four months. But no part of the body was found to change so little as intervertebral substance; after twelve months in water it was very little altered in appearance, and had lost little of its material.

logical Researches vol. ii. p. 372. Poiseuille and Magendie* both remarked that water weakens the contracting force of the heart; it was proved by the experiment of injection in lower animals, with the aid of the hæmadynamometer invented by Poiseuille. It probably exerts the same influence over all the solids. This is alluded to by Boerhaave† under the head of "emollients." As an instance of this class, he mentions first, "pure water, warm, just in the nature of our body; it dilutes and attenuates in respect of the liquids; but softens in respect of the solids. The vapour (or steam)" he continues, "is very proficuous." Another property, which, on experiment, Magendie ascribes to water, is that of promoting the coagulation of the blood; a tendency which he asserts it to possess, in common with tartar emetic, sulphate of magnesia, and the ingredients of the Seltzer, Vichy, and Seidlitz mineral waters.

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* Magendie on the Blood.

† "On the Virtue and Energy of Medicines."

CHAPTER II.

Effects of temperature in Baths—Cold Bath—Reaction.

The before-mentioned effects of water *simply as a substance*, are a small part of those which it is capable of producing; and we seldom have practically a fair instance of their occurrence, *unmingled* with the results of temperature, &c. Abandoning then the line of *mental* distinction, we may adopt the usual method of description, which classifies these effects, as those of cold, tepid, warm, and hot water, externally or internally applied.

The *importance* of this subject should set aside all thought of its triteness, especially as the whole matter has been made the ground of a new popular delusion; but want of space, as well as the frequency with which the investigation has been made, may form excuse for not going into full exposition.* We

* In the works of Floyer, Buchan, Hancocke (Febrifugum magnum, 1723), Giannini, Currie, Bell (on Baths and Mineral Waters), &c. &c., full detail is given, although the topic has fewer volumes in proportion to its magnitude than most others. The best division of baths is probably that of Dr. Forbes: Cold bath, 33° to 60° Fahr.; then cool, temperate, and tepid; warm, from 92° to 98°; and hot bath, 98° to 112°. He very properly, however, considers such limitations to be for convenience only, not for rule, persons and circumstances often requiring modification.

shall merely glance at those points which I conceive to be wrongly explained or not sufficiently dwelt upon by authors.

The temperate or tepid condition allows, of course, of scarcely any effect with regard to temperature. We have, therefore, in it to consider only the *proper sedative effect* of water itself, with, if externally applied, the *pressure*, and the action, if there be such, by virtue of the relations of water with electricity. In baths the pressure is an element worthy of notice, as in some cases it increases the danger of bathing to those for whom local or general plethora renders it improper.* It, of course, drives with some force (greater in sea than in fresh water, and in some waters than in others) from the external parts towards internal organs, and towards the head or whatever part is *not immersed*. It will be alluded to again, in speaking of the cold bath. And the other consideration, with regard to electricity, although I do not remember to have ever seen it noticed, I cannot but believe it of some consequence. Every one is aware of the soothing, lulling, tranquillizing in-

* See Arnott's Elements of Physics, p. 242 and 475. "If a strong glass bottle be firmly corked and then sunk in water, it is generally crushed inwards by the pressure before it reaches the depth of ten fathoms. A man thus let down in a cask of air, would soon be drowned by the water bursting in upon him. A man who dives deep suffers much by the compression of his chest, from the elastic air within yielding under the strong pressure. This limits the depth to which divers can safely go."

fluence of the warm or tepid bath,* in many nervous conditions, of irritation or excitement, or, on the other hand, of exhaustion and debility. Its powers are really highly remedial.

The effects of *cool* and *cold* water taken internally depend so much upon the condition and circumstances of the body, that all beyond mere dilution and refrigeration will come more readily before us under another head.

In the *cold bath*, Dr. Bell (On Baths and Mineral Waters), will not allow that, according to the prevalent belief, "the blood, arrested in its free course through the skin and parts immediately subjacent, is driven in increased amount into the internal organs." He acknowledges that there is an "emptying and collapse of the numerous cutaneous vessels,"—and then goes on to infer from the lowered temperature of the breath, the loss of dryness in the mouth, and of redness in the tongue, and the disappearance of thirst, that a similar or identical condition, the result of

* It is universally acknowledged that the warm bath promotes sleep. See Bell on Baths and Mineral Waters, p. 237, where he makes some remarks tending to confirm the above hypothesis, without saying a word of electricity. See also Dr. J. Coffin on Bathing, with regard to effect of *tepid* baths, and pp. 39 and 43. In such reasoning we are not, of course, to forget that there is conjoined the sympathetic effect upon the whole system consequent upon the peculiar relaxation of the skin, which it is one of the properties of water "as a substance" to produce. Vide, again, Mareard, "De la Nature et de l'Usage des Bains."

sympathy, takes place in internal organs. To a certain extent no doubt this is true, as the sympathy between the skin and the viscera is strong; but, one would ask, if the blood be thus driven from both the external and internal parts, if all the capillaries be thus emptied, what *becomes* of the blood? The heart and great vessels, it would seem, must at least be burdened. Such is to a degree often the case; and it is perhaps the stimulus of this fulness and distention, or its action on the elasticity of those vessels and the heart, that constitutes the *reaction*. But another item must be considered, in order to maintain the possibility of Bell's theory being correct. Such overloading of the heart and great vessels by the ingathering of the contents of all the great organs, and of all the capillaries of the skin, would be dangerous in every case, if the volume of the blood remained the same. Dr. Bell does not admit that even the brain contains an unusual supply. Indeed he implies that the central parts of the circulatory system are not repleted except at the first shock; "the heart beats slower and feebler." It is plain then, that the *blood itself* must contract with the contracting calibre of the capillaries, veins and arteries. An experiment with blood exposed to heat, immediately after its effusion, convinced me of the existence of this thermometrical property. But it being admitted, the weight of scientific authority, as well as of common experience, or prejudice, is still in favour of the occur-

rence of the repulsion of the fluid from external to internal parts in the cold bath. It is a question of some importance, as the propriety and safety of bathing in many cases depends upon it. Cannot the fact that "the air which is expired is no longer hot, or even near so warm as common," and the diminished dryness of the mouth, and thirst, be explained by the diminution of heat, (which is actually *abstracted*, and by no means driven in,) *compatibly* with increased *fulness* of interior organs? The latter of course does not produce its usual effects of *excitement* during the abstraction of caloric, the only danger, except in the very plethoric, being that the fulness may remain in some great organ when the bath is removed, and the common injurious influence of congestion may be exerted. The pressure is another element of which Dr. Bell takes little notice. We have already referred to Dr. Arnott's estimate of this. Personal experiment induces me to believe that it is important.*

The general character of the influence of the cold bath on the economy, depends much on the constitution and present condition of the individual, and on the duration of the immersion. With the robust and healthy, if this has not been long, on leaving the water

* I have often observed that exertion in swimming, even when moderate, produces a degree of cerebral congestion, (shown by headache, vertigo, &c.,) in those who are liable to it, such as is brought on by no common or even violent exercise out of the water.

there follows what is called the "reaction." As to this, also, Dr. Bell appears to go almost too far. He considers all that occurs to be precisely similar to the gradual recovery of heat in spring, by an animal which has been torpid through the winter; that the body on leaving the bath, is merely restored by the surrounding temperature, to its previous heat, while our sensations, from contrast, represent it as being increased with a feeling of warmth and glow. He supports this by a reference to Currie, who found that the temperature after emerging was not raised, indeed was actually lower than before the bath. But in Currie's experiments, the time of immersion was in no case less than twelve minutes, and in several, was as much as thirty. Here, and in any longer time of exposure to the water, there is some analogy to the re-calorification of the torpid animals, as well as to the slow warming of the boy mentioned by Edwards, (Part IV. Chap. iii.) who after immersion in the water of a frozen river, remained chilly for three days. The assertion is correct that in the majority of cases, in which the bather continues in the water for many minutes, what occurs on leaving it, is merely the gradual recovery of former temperature. The error is, in supposing that cold cannot be applied for a short, and in some constitutions, for a considerable interval, so as to be followed by what more exactly answers to the name of reaction, a real increment of temperature at least on the surface.

May there not, again, even when this is not the case, be a reaction as far as the distribution of the blood is concerned? Can it not happen that, although the whole heat of the body is diminished, still the "collapse of the cutaneous vessels," increasing as we believe the flow towards internal parts, is followed by a returning impulse, causing the amount of blood on the surface to become greater? The skin does often in healthy subjects become red after cold immersion. This every one must observe, as well as the frequent actual increase of temperature after short exposure. Else why do some authors disapprove of the application of cold to local inflammations, of the eye, for instance, (M'Cormac,) "because of the reaction which follows them?" Or how does long-continued cold so often produce inflammation, on the restoration of usual heat? Currie himself speaks of the "sudden and powerful stimulus" of cold affusion. Dr. Graves states that he has given up the use of cold lotions to the head, even when indicated, because in the negligent way they are usually applied, they actually *increase the heat* of the part. Dr. Macartney gives similar cautions against the mere sudden application of cold in inflammation; which he says on account of the reaction, is by no means sedative. In two experiments which I instituted, however, the result did not accord entirely with my expectations. A young man in vigorous health, was immersed in a bath at 55° Fahrenheit, for two minutes. The utmost

care being taken to insure a fair trial, the temperature under the axilla was then after drying, found but a trifle, one degree, perhaps not to be counted, higher than it had been before the bath.

Common opinion certainly is in favour of the occurrence of reaction after the cold bath, in the healthy and vigorous, in a more positive sense than Dr. Bell allows. Indeed, in Currie's experiments, a degree of such action was observed while in the water. In all his trials the thermometer placed under the tongue on first entering the water, sank from about 98° to about 88°, and *then rose* again gradually to about 95°. In one instance where fear added to the influence of the cold, after sinking to 83°, it rose to 92°; the immersion was protracted to thirty-two minutes, when after having remained at 92° for thirteen minutes, the *power of reaction* seemed overcome, and it fell rapidly, in three minutes reaching 85°. This, it may be remarked, points to the only sure way of obtaining the locally sedative effects of cold; to apply it steadily to sufficient degree and time to *overcome reaction*. As far as redness is concerned, I have proved this by hundreds of trials on a local inflammation; and to my own satisfaction as to temperature also, in this way as well as by the effects of the cold douche applied for a shorter or longer time, in temporary increase of the heat of the cranium. The idea of reaction pervades all

our reasoning upon the changes, morbid as well as healthy, in the excitement of the body; although the nature of that reaction is not explained. Some hold it to be altogether a *sui generis* vital action; they are those who consider that chemistry and mechanics are to be banished from almost the whole domain of physiology. The opposite tendency to this has become a more common fault in this century, some of the most prominent investigators,* as Liebig (Beiträge zur Physiologischen, &c., Berlin, 1844,) being accused of it. This is an extreme to be carefully avoided; and we may not therefore suppose, what might else seem plausible, that a *part* of the phenomena of reaction may be produced by a kind of actual rebounding by virtue of the elasticity of the heart and great vessels, into which the blood has been propelled with some force by the application of cold to the surface. It is more reasonable to refer all that takes place to the inherent laws of our bodily nature, adapting it to its circumstances, by providing that diminution of heat by extrinsic means, should be met by increased vigour in the intrinsic sources of supply: the working of which law has been observed since Hippocrates. "Αἱ κοιλιαι χειμωνος και ἠρος θερμοτάται φύσει.

The continued application of cold, as has been

* See also Magendie on the blood, for an instance of leaning towards it. (p. 24.)

said, partly, or if very protracted and severe, entirely overcomes the reaction. Then—which is the state of things most commonly desired and observed—the action of the cold bath is purely sedative.* That this, however, is different from some of the common effects of cold suddenly and temporarily applied, is plain, as, for instance, when we sprinkle cold water on the face to revive a person from syncope. The sudden impression here, like all sudden impressions, is immediately stimulant to the nervous system. It is by striking a line, then, between the usual sedative and occasional stimulant action of cold, that we may see how the cold bath has been called, and properly so, in some applications of it, a tonic (Forbes). It is the function of cold to produce contraction, by withdrawing caloric, the immediate opponent of cohesion. Now, without attempting to revive the old hypothesis of *tone* in organic tissue, we must believe —for facts daily prove it—that there is a difference, and one of importance to comfort and health, in the degree of density, closeness, firmness, or, on the other hand, of looseness, flabbiness, relaxation of the skin, of the muscles, and of other parts—shall we imagine even of the nerves? Warmth and moisture, in many

* Vide Magendie on the Blood, p. 46; and also an article by H. L. Hodge, M. D., in the North American Medical and Surgical Journal for July, 1828.

circumstances, relax, and moderate cold *braces up* —it is a common phrase and a common sensation. The termination of summer, and the first cold days, are thus marked in those who in the warm weather were weak and languid. Dr. Bell would insist that it is the abstraction of surplus caloric that acts thus in all cases; but is it those only who abound in bodily heat and general vigour who are thus braced and innerved by cool air? Not at all; the feeble and nervous often have the same experience. And so with the cold bath; although a sedative, it is many times a sedative tonic. Or we may prove its right to the latter title indirectly in force of its certain efficacy, by improving the condition of the skin, in giving the constitution the best opportunity to maintain or regain its due powers, and in consequence of the law already mentioned, that abstraction of heat, if *not excessive*, calls forth more active exercise of those organs interested in calorification.

It were easy to dilate on the *warm bath;* but it is forbidden by the already great length of our essay. Dr. Bell's remarks upon it are excellent.* The same may be said of the stimulant, diaphoretic, &c., powers of the hot bath, of the vapour bath, douches, &c.,

* See also experiments on the warm bath, in an inaugural dissertation by Henry William Lockette, of Virginia, 1801, in the first number of the Maryland Medical Recorder.

which may be again alluded to in speaking of some of their applications. It may be observed, in passing, that many persons become prejudiced against the warm bath from having used it *too hot.* The warm bath should scarcely ever be above 98° Fahr. The hot bath is a decided *stimulant;* and of course may be followed by sensations of debility, like other stimulants,—or may produce headache, &c., when an excitant was not called for.

CHAPTER III.

Relations of Water to Hygiene—Death from drinking largely while heated, properly explained—Effects of substances in combination with water—Use of bathing.

THERE is, at present, in some circles, the voice of *fashion* added to the many names of authority, and the many reasons *a priori*, in favour of the use of water as a *universal drink*. In a periodical of 1831, we find mentioned in its support the opinions of Pliny, Boerhaave, Hoffmann, Haller, Zimmermann, Floyer, Arbuthnot, Wallis, Leake, Cullen, Gregory, Cheyne, Saunders, Faust, Parr, Pomme and Rostan of France, Cirillo and others in Italy, &c. &c., as well as the practice of Demosthenes and others among the ancients, and now of the hardy Arabs of the desert, and of millions in Asia, Africa, and the islands of the Indian and Pacific Oceans. The abundance with which the element is afforded in nature would seem to point to its superior adaptation to our wants,—although the fact that it is never, even in rain-water, found entirely free from other ingredients, may tend to modify such a conclusion. *Those* ingredients, however, can give no argument from nature for the

propriety of the additions prompted by over-eager or depraved taste; and it does appear much most reasonable to be satisfied with the selection made for us, and to confine the use of other valuable substances to times of disease and debility. The "milk and water" regimen is without doubt, as a general rule, that most conducive to health and long life.

Water exists as a part of many solid articles of our food, though in very various quantity; thus the fixed oils or fats are nearly anhydrous, while turnips and cabbages contain more than 92 per cent. of water.* Wheat, according to Boussingault, contains 14·8 per cent.; fresh meat, according to Beekman, 74·8 to 75; cows' milk, 87·02; human milk, 87·98. Count Rumford and others have believed that a part of its use is to afford actual nutrition to the solids. Prout is of opinion that it decomposes and gives its elements to the tissues only when combined with other principles, or when in a nascent state. Persons with weak stomachs, it is said, should not use a great deal of liquid food. In certain conditions of the system, again, the temperature becomes a necessary consideration. Says Beddoes, (Hygiene, vol. 2,) "It is clear from one hundred instances that when persons are heated, the sudden use of cold water, whether external or internal, to a certain extent, will destroy life and health." He

* Pereira.

goes on to caution ladies against "liberties with themselves" in the use of cold water "at certain periods." It is again remarked, that "only when the *chill of perspiration* has come on, then undoubtedly every medium capable of depriving the body of warmth" menaces danger. And I find nowhere better stated the philosophy of the matter than (vol. 2, pp. 43–5) in his words: "the effect of any cooling application should be considered as acting through successive moments, or by successive quantities. If a person in a heated state, drink half a pint of cool liquid, that may not sensibly reduce him below the natural healthy state. But if he pour down a double quantity at once, the last half pint may be regarded as operating upon the system, reduced by the first, and sinking it into a dangerous chilliness." Christison (on Poisons, p. 104) asserts the most common form of death from this cause to be instantaneous, from the impression on the stomach. When combined with exposure to a burning sun, congestive apoplexy occurs along with the gastric irritation. An account by Dr. Watts is referred to, of instances in New York, in 1818. The symptoms were "very like the effects of some narcotico-acrid poisons." Sometimes they were more nearly allied to those of the pure irritants; as violent colic after drinking iced water. Is not diarrhœa also occasionally an accompaniment of excess in the use of ice-water in summer? Haller mentions a man who thus brought

on symptoms of acute gastritis, of which he died in fifteen days; the stomach was then found gangrenous and ulcerated at its fundus. Cholera has also been referred to the same cause. A case is given by Dr. Duncan, of a man in good health, who took a large draught of cold water on rising in the morning; soon went to bed again with pain in the pit of the stomach, extreme anxiety, and incessant vomiting, and in twelve hours died. No disease whatever could be detected in the dead body. Poison was out of the question. Hoffman says he was acquainted with instances of fatal inflammatory fever induced by drinking too freely of cold water, and a suspicion of poisoning in consequence excited. But accidents of this nature occur much most frequently in those whose stomachs and general forces have been debilitated by intemperance;* the danger to a healthy person has been overrated. And the fact, that enfeebling habits increase the danger, joins with others to show, that it is not so much the *heated* as the *exhausted* state, in labourers and others, which is the occasion of it. It is what Beddoes calls the "chill of perspiration" and fatigue. This is illustrated indirectly by Dr. Duncan's case. The condition of a person just rising in the morning, having taken no food or drink, is much more analogous to a feeble and exhausted state than to that characterized by

* See N. Am. Med. and Surg. Journal, October, 1830.

the *excitement* of excessive caloric. Confirmation to this is afforded by Dr. Davy, (Researches, vol. i. p. 201,) in concluding an account of some experiments on the effect of violent exercise on the temperature of the body. He observes, "there are, on record, many instances of sudden death, from drinking cold water, or from plunging into cold water, after exhausting fatigue, and when the body is commonly said to be heated. Probably in such cases, in conformity with the above observations, the temperature of the body has been actually reduced below its natural standard, taking the tongue as an index of the internal heat, and the fatal effect may, in part, be the consequence." Dr. Currie (Reports, chap. xii.) took the same view.*

In determining the effects of water upon the system, its *quality* is of consequence.—Cullen did not believe much difference to exist between common waters, nor that any were injurious whose taste and smell were not striking. Heberden, and the large majority of others, think otherwise. Heberden ascribes bronchocele to the waters where it prevails. Sharp (Letters from Italy) asserts that children are never born with bronchocele; and the inhabitants of

* The theory and even practical directions of Dr. Rush upon this subject, appear perhaps less philosophical than most other emanations from his mind. Yet they agree with the popular notion, and are almost universally adopted.

Steinseffeir in Schmiderberg, are said by Hoffman, to have freed themselves of it by abstaining from certain fountains. The plica polonica of the hair in Poland and Lithuania has been in part ascribed by Hoffman to impure water. Dr. Mead and Van Helmont mention cases of colic brought on by certain waters. Dr. Lister (Journey to Paris) observed that the Parisians are peculiarly subject to stone, which Percival thought, although not altogether to be accounted for by the calcareous water, to be at least encouraged by it. Says Sanctorius, "heavy water and a foggy air convert the matter of perspiration into an ichor, which, when retained in the body, induces a cachexy." The people, and even cattle, of Siberia, near the river Kirenga, which is remarkable for impurity, Percival* affirms to be almost universally scrofulous. In Minorca, brackish and hard water abounding, seems to produce a prevalence of enlargement and induration of viscera, and disorders of digestion; and there also similar affections are found in brutes. The ancients, observing this, examined the livers of cattle, to test the salubrity of a place where they proposed building a town. They had also other tests of water. "Damnantur," says Pliny, "imprimis fontes quorum aquæ

* See Dr. Percival's essays (Warrington, 1788) for this and several other facts and quotations.

decoctæ crassis obducunt vasa crustis." Ovid is thus quoted, Metamorph., Lib. xv.:

> Cui non audita est obscenæ salmacis undæ,
> Æthiopesque lacus? quos si quis faucibus hausit,
> Aut furit, aut patitur mirum gravitate soporem.

Celsus sums up thus: "Aqua levissima pluviatilis est; deinde fontana, tum ex flumine, tum ex puteo; post hæc ex nive,* aut glacie; gravior his ex lacu; gravissima, ex palude." Galen, Avicenna, and Lucretius ascribed the elephantiasis of the Egyptians to the use of the waters of the Nile. In this country, cases frequently occur of persons seriously affected by drinking the water of limestone and other districts. By changing from hard to soft water, Percival mentions two cases of cure of gravel. Boiling and filtering, or *distilling*, he believed to be very useful in such cases. Heberden and Lambe proposed distilled water as a substitute for common water generally, on account of the organic matter in the latter; but distillation does not remove all traces of this. In calculous affections, as the oxalate of lime diathesis, this process has been thought of use. On shipboard the advantages of distillation might be great; they were long since suggested,—(mentioned by Jameson, 1788, under the name of Ogilby's process,—and as treated

* Celsus would thus seem to agree with Hippocrates in repudiating the use of snow and ice-water; both probably from mere hypothesis.

of by Pouteau),—and recently (1841) urged by Coulier. The injury to which water is liable from its *mode of conveyance* is an interesting subject. Dr. Percival, from an experiment with brick steeped four days in distilled water, infers the impropriety of lining wells with brick—from the combinations with alum effected by the long exposure of the clay to the air, "the sulphureous exhalations of the pit-coal used in burning it," &c. With others of the ancients, Galen, and also Vitruvius, and later Neumann (on chemistry), Falconer (on Bath waters), and Baron von Swieten are referred to as condemning the transmission of water through lead pipes. Dr. Tronchin gave an account of the colic prevailing in Amsterdam from the use of water slightly impregnated with lead. In 1803, Dr. Lambe published a treatise on "Spring Water," cautioning against the danger of lead pipes, and holding up the idea that common water is not only a corrosive but a solvent of lead. He includes spring water, mentioning several instances. Fourcroy asserts that lead suffers no alteration from pure water, "yet the sides of leaden water-pipes are covered over with a whitish crust, or a kind of ceruse, the production of which," says he, "is owing no doubt to the various matters contained in the water." Christison, on the other hand, after careful investigation, lays down the rule that water, to be safely carried through leaden pipes, should have more than $\frac{1}{4000}$ of saline matter.

Externally applied, the *hygienic uses* of water have

an importance not sufficiently or generally appreciated. It has been splenetically remarked, that physicians render a more certain and greater benefit to the public by their study of the *laws of health*, than by attempting the removal of diseases so often beyond their control. This is saying too much; but it is worth considering how the truth does lie as to the two spheres of usefulness.

To justify the etymology of his name, the "physician" should be, as "naturæ minister et interpres," bound to promulgate all those laws which concern the *maintenance* as well as the restoration of health. Were, then, the subject of the hygienic uses of water rarely investigated, it would be worth while here to study it in detail; but the ground has been already so thoroughly trodden, especially in the work of Dr. Bell, (on Baths and Mineral Waters,) that *logical completeness* may be sacrificed to an aversion to repetition and prolixity. A mere glance at some of the leading points is all that need be attempted.

"Bathing," says Bichat, "is a law imposed by nature upon all perspiring creatures." "I consider bathing," remarks Struve, speaking of the management of infants, "as the grand arcanum of preserving health." From birth to death, at any age, it is almost a *necessity*, not only for the purpose of cleanliness, but to maintain the healthy secretory and excretory functions of the skin, and by sympathy and connexion those of the mucous membranes,

glands, &c. "Les anciens rapportent que Médée employa ..... les bains chauds ..... Par leur moyen elle rendoit la peau plus souple et les membres plus agiles. C'est pour ce la qu'elle pretendoit rejeunir les vieillards, et qu'elle fut accusée de les faire bouillir dans de grandes chaudières."*

To the bodies of infants, the experiments of Edwards† and others amply demonstrate the impropriety of applying frequent or great cold; it being shown that their amount of caloric is less than that of adults, and that with each exposure to a low temperature the power of evolving it is diminished. For them the warm, tepid, and cool baths are most appropriate. In adolescence the cold bath is most advantageous only where there is *sufficient vigour* to produce full reaction, and where it is not forbidden by general or local plethora. *Too long-continued* immersion often lessens the benefit derived from the bath; and, observes Beddoes,‡ "weakly people every day destroy themselves by going into cold water when they are not sufficiently warm." This author, therefore, as well as Jameson, A. T. Thomson, and others, recommend gentle exercise, short of perspiration, before immersion. "For the same reason," Beddoes continues, "I can see no sense in the common notion that it is best to bathe with an empty

* Cabanis, Du Degré de Certitude de la Médecine.

† Sur l'Influence des Agens Physiques sur la Vie.

‡ Hygeia, by T. Beddoes, Bristol.

stomach. I would not recommend the cold bath to a person full gorged; but it is desirable that the stomach should be in a state of gentle activity, as well as the external surface of the body." There are very many who have not vigour enough to bear with advantage a cold shower-bath before breakfast; an hour after it is usually a better time.

Where bathing frequently is not convenient, the immense advantage of daily cold sponging or ablution of the greater part of the body, is as certain as any thing in hygiene or medicine. It lessens excessive sensibility of the skin, and thus in fact of the whole system, to slight impressions, keeps unclogged the cutaneous follicles and ducts, and thus proves a most valuable prophylactic against catarrh, asthma, and other affections of the mucous membranes, as well as "nervousness," or what, with Dr. Holland, we would call "excess of nervous power,"—sensitiveness, and excitability. Hundreds of instances might be found where its benefit was palpable; and yet how few are those who avail themselves of it, compared with those who are content with weekly or even monthly ablution.*

* Somewhat related to this subject, or at least to the habit of using only warm applications to the feet, &c., are the following remarks of J. Hunter's. "A habit of uniformity in the application of heat and cold to an animal body renders it more sensible to the smallest variation in either; while by the habit of variety, it will become in a proportionate degree less susceptible to all such sensations. This is

From the frequent *deficiency* in the vigour necessary to insure perfect reaction after the cold bath, it would seem that, as a general rule, the *tepid* is the safest and best. This is especially true of the feeble and aged; although instances occur—I am acquainted with one at least—of men at the age of eighty and upwards who use the cold bath daily the whole year round. According to the best authorities, the *warm* bath should not be generally used simply as a luxury in time of health. Hodgkin and others, however, think that its use is too much restricted to times of disease, and that it should be a thing of every day employment. In case of great fatigue and exhaustion, muscular or nervous,—as after a journey, loss of a night's rest, exposure to cold, &c.,—it is very appropriate. Indeed, Bruce avers, in his "Travels to Abyssinia," that "when *overheated* by violent exercise, a warm bath cooled him and renewed his strength much better than a cold one of the same duration." The hot bath, of course, is never proper in a state of health. The Russians and Finlanders do, to be sure, indulge in it or the hot vapour bath, *qualified* by a subsequent immersion in snow or cold air; but it is very doubtful whether we should gain any thing by adopting their custom. The *cautions*

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proved every day by persons who are accustomed to clothe themselves warm. In these the least exposure to cold air, though the effect produced in the skin is not perhaps the hundredth part of a degree, immediately gives the sensation of cold, &c."

necessary in the use of baths, general and local, and their impropriety for certain constitutions and circumstances, are well treated of in Dr. A. T. Thomson's excellent book on the "Domestic Management of the Sick-room."

Dr. Bell's* ideas with regard to the advantage of the cold bath in visceral diseases are peculiar, in conformity with his theory of the blood not being "driven in," as usually supposed, by external cold. Similar also is his light estimation of the common measure of always wetting the head first on entering a cold bath. In sea-bathing this can be, and is, easily, done without the elevation of the heels of which he complains, by using "cold affusion" from a bucket just before stepping into the surf. Sea-bathing has itself been a theme for volumes; but it can find no room in the present essay. We are now at liberty to come at last to what perhaps should be the pith of our subject.

* On Baths and Mineral Waters, p. 140–143, &c.

CHAPTER IV.

Medical uses of Water—Diluents.

The history of the use of water to some extent as a therapeutic agent is without date. So universal and abundant in its diffusion, so easy of access and of application, so *obvious* in its ministration* to the wants and comforts not only of the healthy but of the diseased among mankind, instinct and common sense have led to its employment to some extent as a remedy since the creation. But the plain teaching of reason in this as in other cases has been often opposed and frustrated by fanciful notions and prejudices; by the idea that every thing connected with disease is unnatural, almost *preternatural*, and not to be acted on by the same laws as those which govern the body in its ordinary states. We occasionally meet even now with persons, not always ignorant, who would shrink as from poison from the thought of giving a glass of

* It must be again recollected here, that the design of this essay is to *oppose* hydropathy, by a brief sketch of the *real* value of water in medicine, as put upon it by the *profession*, with the limitations defined by the *experience* of *ages*.

cold water to one in the heat of a raging fever. Here instinct on the part of the patient often defends him against such deprivation; the nearest pitcher, or as in a case I have heard narrated, the nearest horse-bucket, affording the means of relief and cure, so sternly denied by mistaken kindness.

We find that Hippocrates thought the subject of drink and dilution one of importance; "ϱαον πληϱουσθαι ποτου η σιτιου." We may infer that he preferred warm fluids generally in disease, from some other expressions about the effects of cold. He generally also added to water some mild ingredient, as in his "barley ptisan," or "eight parts of water to one of honey, with a little sweet wine and sometimes vinegar."

And it may be incidentally here remarked, that it would savour of quackery for any one to insist that in all our use of so valuable an article as water we must employ it, the simple monoxide* of hydrogen, *free from all other* substances. Nature teaches the contrary; no such water is found, such can with difficulty be manufactured. We always find added to it portions of various matters; in springs, in rivers, and even in rain.† And this addition we should often still further extend, for various purposes, as for in-

* Vide Professor Hare, for this improved appellation.

† Rain water has been found to contain carbonate of ammonia, carbonate of lime, sulphate of magnesia, and other salts, though in less quantity than other waters, besides chloride of sodium, chloride of potassium, &c., oxide of iron and organic matter.

stance, to humour and support the stomach: but this does not in the least detract from the position that in many, almost all these instances, it is the *water*, acting mainly by virtue of its dilution, to which the great advantages are to be ascribed. This is true to a great degree even in the case of mineral waters. Says Hoffman, "The major part of their efficacy is, beyond all dispute owing to the quantity of pure elementary water which they contain." Also Cullen, quoted by Jameson, (on diluents,) "almost all kinds of mineral waters, whether chalybeate, sulphureous, or saline, have been employed for the cure of scrofula, and seemingly with equal success and reputation; a circumstance which leads me to think, that if they are ever successful, it is the elementary water, that is the chief part of the remedy." Such was also the opinion of Dr. Holland, (Med. Notes and Reflections.)*

Asclepiades, Celsus, and Galen, held rather arbitrary, almost contradictory, opinions on the subject of diluents. They all denied drink in the first days of fever, relaxing such discipline when its violence had abated. Celsus, indeed, advises most copious

* Besides these, among others Dr. Saunders, supported by the testimony of writers with regard to the sameness of the action of the waters of Malvern, Bristol, Lauch-Stadt, and the hot Caroline baths of Germany. Says Dr. Bell, "In fine we are constrained to admit, that there is hardly a disease cured by mineral water that has not been cured or greatly mitigated by free potations of common water."

use of cold water in the "greatest increase" of the disease, "non ante diem quartam."

Still later, Van Helmont allowed his patients entire license in drinking. Boerhaave writes in high praise of the attenuating and diluting power of "pure water, warm, just in the nature of the body," considering it when taken in large quantities, "the greatest diluter of thick blood;" and Hoffman recommends diluents, "post sanguinis missionem," as the principal remedies in fever. Others, as Cardanus, T. Jameson of England, Smith, Hancock, Currie, &c., have written upon the subject, although it has never yet received all the attention it deserves. It is said that even so late as in the practice of our Rush, Kuhn and Physick, it was, at least till toward the close of their career, the common custom to deny cold water to the parched lips of their fever patients, and to force upon them warm herb teas as substitutes. The advantage of these in some conditions is of course not denied. Some excellent remarks with regard to the internal use of water, will be found in a short essay by Dr. Holland.

Of the *external* application of water in disease, there is mention in the works of the Sage of Cos. In spite of the denouncement* of cold already alluded to, in the very next aphorism we find him, or the

* Aphor. 17, το δε ψυχρον σπασμους, τετανους, μελασμους, και ριγεα πυρετωδεα. And again, 20, Ελκεσι το μεν ψυχρον δακνωδες, δεγμα περισκληρυνει, &c.

work ascribed to him, recommending the affusion of large quantities of cold water as a remedy for certain cases of tetanus, and of cold for hemorrhages, inflammations, &c., although he reiterates what, as a general rule, is still recognised, that "τα ψυχρα, οιον χιων, χρυσταλλος, τω στηθει πολεμια." Galen decidedly approved of the use of cold externally in diseases. The Persian physicians, who are said to be followers of Galen, Sir John Chardin relates to be partial to cold bathing in fevers. Chardin himself while in Persia, afforded a remarkable instance of the success of the practice. About the earliest modern work on the subject now extant, we find to be an anonymous treatise, "De balneis apud Graecos," 1533; between that date and Floyer's, several were published, by Fumanellus, Clivoli, Guintherus, &c. Sir John Floyer* did much toward the introduction of cold bathing into England, as a remedy for various chronic diseases. Cirillo of Naples, De Hahn on the epidemic of Breslau, 1737, Von Hyde on the surprising effects of cold water, and Samoilowitz, on the plague at Moscow, 1771, are spoken of as advocates of the use of water in febrile affections. In 1791 Dr. Jackson, of the British army, published an account of his success with this treatment; Drs. Wright and Brandreth had experimented still earlier, as had also Dr. Willis,† and in

* Vide Macartney on Inflammation, p. 184, &c., and Dr. Bell.

† Dr. Reid, Practice of Med. p. 87.

1797 came out Dr. Currie's "Reports," perhaps the most important work on the subject, and which is properly spoken of, as "a sort of classical work in medicine." Dr. Thaer also performed some successful experiments with cold ablution, in Prussia, about the year 1825.

In speaking of the *particular* medical applications of water, the most convenient arrangement will be to abandon the division on the ground of temperature, and,—after a few remarks on dilution generally,—that also of external or internal application. With regard to the warm bath, for instance, it would be in vain to attempt to specify all the various cases in which it is employed: in children, especially, there are few complaints in *some part* of the course of which it is not a common and a very proper measure of auxiliary treatment, if not itself worthy of being called *remedial.*

On the subject of diluents, I have found no better reflections than those of Dr. Holland; confirmed by the earlier observations of T. Jameson (A. D. 1788). The latter speaks of water as the basis of all diluents, and proceeds to recommend them as indicated in every order of febrile affections, in inflammatory diseases, eruptive fevers, hemorrhages,—in fluxes and serous discharges, to supply waste of fluids, and wash off irritating substances; in nervous diseases, from their tendency to diminish excessive "vital power;" and, in some of the "diseases arising from

depraved habit," as morbid corpulency, scrofula, &c., ascribing the reputation of mineral waters in the latter to the effects of the dilution principally.

Dr. Holland calls water "the only diluent which really concerns the animal economy," and properly questions whether its use as such is sufficiently regarded in disease. He considers it often advantageous by the act of merely washing out the alimentary canal; an advantage by no means "to be disdained from any notion of its vulgar simplicity." He believes that in many states of the alimentary canal, the free use of water at stated times produces good, not to be attained by other and stronger remedies. The maintenance of the healthy action of the bowels is given as an instance, and still more especially where the secretions or products of digestion become vitiated. In some instances, where often and largely used, even so far as actually to alter the state of the secretory surfaces, by direct application to them. These circumstances are mentioned upon actual experience, as in cases of dyspepsia,* where it is especially an object to avoid needless irritation to the system.

In recommending in cases of acidity, the addition

* In the attacks of pain, flatulence, &c., to which dyspepties are liable, as well as in some other cases of colic, sipping hot or boiling water is often a good domestic remedy. And still more frequently will nausea and vomiting be relieved by chewing and swallowing little pieces of *ice*.

of carbonate of soda, he observes, "It is often more beneficial in this way than given in a smaller proportion of liquid, a point connected with the action of mineral waters, which clearly influence by quantity and dilution the medicinal operation due to water alone." He reminds us, in reference to the foregoing uses of diluents, that the lining of the alimentary canal is to all intents a *surface*, as well as the skin, and capable of being acted on in a somewhat similar manner. And this remark is applied not only to the mechanical effects of the remedy, but also to the conveyance of cold to internal parts, which, he thinks, the simplicity of the means, or false alarm besetting it, has caused to be too much neglected. As to temperature, he thinks we may consult the feelings and desire of the patient. The second condition under which diluents may be viewed, as altering certain morbid states of the blood, Dr. Holland considers one of more difficulty, and connected with questions in physiology and pathology, still under active research. The singular facts observed in the Asiatic cholera* are alluded to, as showing the ex-

* The following are some of the results given by Andral (Anatomie Pathologique, vol. i. p. 107):—"Sur un individu sain, le sérum du sang contient, sur 1000 parties, 906 parties d'eau; chez les cholériques, on n'en trouve plus que 854. D'un autre côté, on a constaté que, sur 100 parties, le sang des cholériques contient 66·8 de caillot, pour 33·2 de serum, tandis que, dans le sang ordinaire, on n'a pour la même proportion de sérum que 27·8 de caillot, ce qui fait

tent to which change may take place in the blood under the influence of disease. But, from considerations with regard to the rapidity of absorption and the almost constant relation of excretion to imbibition, he infers that we have little justification for giving diluents with direct intent to alter the qualities or proportions of the blood, independently of actual experience. Yet that, on the other hand, we have reason from the same considerations to believe that liquids may freely and without fear be given wherever there is demand for them from the sensations of the patient. And this conclusion, that we may always safely make these natural feelings our rule, because even if they are vitiated, nature provides the remedy for any excess, he considers one of great practical importance. But it appears to me, that, in some cases, we may even transcend this rule; that cases must arise, where diluents, water at least, may, like other remedies, be given in greater amount than inclination would suggest, in view of the effect, of sedation, refrigeration, &c., to be produced. The objection to this may be the interruption to digestion, caused by too great a mixture of water with the food, lessening the action of the gastric secretion; but this can obviously apply only where it is given at, soon before or soon after a meal. Let a time be

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une différence de plus de moitié. Le sang des cholériques contient donc moins d'eau que le sang ordinaire." &c.

chosen, as far as possible distant from that of taking any considerable amount of food, and I have no doubt a great deal might be done where refrigeration, dilution, &c., are needed, without any risk of injury to the digestive function or organs. It is illustrated by what occurs in conditions not amounting to actual disease. In such conditions, I have observed it over and over again. And long before the days of Friar Tuck, as well as so far into the age of temperance as to be within the memory of some of the present rising generation, the plan of that worthy to clear for action a head rather turbid from free *potations* of *wine*, has probably often been adopted. Large draughts from other wells besides that of *his* favourite saint, have similar effects.*

To return to Dr. Holland. To the rule before mentioned, he makes no exception, even in the case of diabetes,† and much less still in malignant cho-

* Speaking of the treatment of the insane, Dr. Conolly remarks, "it should never be forgotten in a lunatic asylum, when a patient is noisy at night, that a copious draught of cold water is often a better sedative than any medicine." (Reports of Asylum at Hanwell.)

† The propriety of allowing entire license in drink in dropsy also, is an interesting subject. The majority of intelligent physicians is now, I believe, in favour of very little restriction beyond the inclination of the patient; believing that a due degree of dilution rather promotes than antagonizes secretion. This was part of the treatment of Bacher in dropsy, for the secret of which he once obtained from the French king a large sum of money. Sir George Baker is stated to have published some cases in the London Medical Trans-

lera, and continues with some excellent remarks on the effects of diluents on the secretory and excretory functions. We dwell upon his essay, because of its value, and because it affords an admirable *instance* to refute those who would assert that the uses of water are neglected by professional men, and who would ask preference on that account for a system based upon *some* of these uses *alone*. As an instance of the action of this class of remedies, he mentions that in the kidneys the proportion of the lithates or other saline ingredients, removed through these organs, may be augmented by a large and rapid passage of water through them, and the skin, he asserts, may be very similarly affected. "It is probably in this indirect way that diluents have greatest influence upon the blood; and here we find the best explanation of their utility in certain cachectic cases." Something too, he thinks, is gained by mechanical effect on secreting tissues; removing, by copious passage of fluid, a condition which sometimes occurs of *less permeability* than exists in a state of health. The alterative effects of mineral waters in large quantities are again referred to as illustrations.

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actions, "where the patients were recovered from a most dangerous state by a quantity of diluting drink." Also, twenty experiments, confirming the same practice, were described by Dr. Home, of Edinburgh. Dr. Milman asserts that "those medicines are fruitless without drink, which, with its assistance, often succeed very happily."

Excellent rules for the administration of water, cold at least, will be found in Dr. Currie's reports. (vol. i. p. 77.) However questionable his theory of the "stricture of the capillaries," and his application to affusion of the term "stimulus" may appear, his practical precepts, with regard to both the internal and external use of cold water, are as sound and safe as any that could be given.

CHAPTER V.

Use of water internally in fever—Cold affusion—Douche—Hot applications for headache, influenza, &c., by Dr. Graves.

So abundant is the evidence of the value set upon water as a remedy, that were I simply to copy the notes I have made upon the subject from *practical* writers, it would overpass the limits which should properly belong to this essay. For this reason, and from want of time to make the best arrangement, we shall first attend to some of its more important and interesting applications, and then, in general, be restricted to no definite order of enumeration. The great object is to show to how many purposes water may be applied, and has been, and is, applied by the profession.

Of the warm bath, it has been already said, that it were useless to attempt to detail all the cases in which it is useful. Taking up a recent work on the diseases of children, I found scarcely an exception to the rule, that in every affection, at some stage or other, it was recommended. Some cases, however,

where it is especially serviceable, may be mentioned incidentally as we proceed.

It is in fevers, inflammations, hemorrhages, and nervous affections, that, as a general rule, we find the aid of water in its various modes of use, most frequently of importance. Currie remarks, that even before his time, Smith had proposed it as an almost universal remedy, and Hancock had written his "Febrifugum Magnum; or, Water the best cure for Fevers, and probably for the Plague!" In it, "the internal use of cold water in scarlet fever, small-pox, and measles, and instances of the efficacy of this simple means to restore repelled eruption, and bring on sweat," were pointed out. The first of the diseases thus mentioned, is that which, in connexion with this remedy, has perhaps attracted the most attention. Yet in other forms of fever, especially since the time of Dr. Currie, it has been extensively used. The first trial which this practitioner made with it, after encouragement from the success of Drs. Wright and Brandreth, was in a "contagious fever," which broke out in 1787, in the Liverpool Infirmary. Seven patients, on whom cold affusion was employed, all recovered. He was cautious not to venture on it where the strength was greatly exhausted. In 1792, it was tried in a "typhus or jail fever," in the 30th regiment, stationed near, or in Liverpool. Of 58 cases, in 26 the attack seemed to be cut short by the cold affusion. Here again it was only resorted to in

those "whose heat was steadily above the temperature of health," and whose strength was not extremely reduced. Seven other cases of fever, in the years 1790, '91, '92, are next mentioned, where it proved completely successful. He also mentions the "tepid" affusion (87° to 97°), as used in those feverish affections where the morbid actions are weakly associated, &c., believing that the tepid lowers the temperature of the body as speedily as the cold water, because of the greater evaporation, and because the tepid affusion is little, if at all stimulating, and does not, like the cold affusion, rouse the system to those actions by which heat is evolved, and the effects of external cold are resisted. Yet he prefers it principally in children. For the manner in which he employed the remedy, at both temperatures, and rules concerning its propriety in different cases, stages, &c., we refer to the 4th chapter of his 1st volume. There could be little danger of harm resulting from the practice, and much good would be attained by it, if these rules were always carefully adhered to. His great principle is, that the time for the external application of cold water is, "*when there is no sense of chilliness present, when the heat of the surface is steadily above what is natural, and when there is no general or profuse perspiration.*" The same rule he applies, by the way, to its internal use. In his second volume, published six years later, farther cases of typhus, besides other diseases, are

given, with some in which the practice was less successful. He had then received accounts of its success in different parts of Britain, on shipboard, and in warmer climates; and of its failure in the yellow fever in Philadelphia, in 1793; there, however, on *different and less correct principles*, in the practice of Dr. Stevens and Dr. Rush.

Of other authors, in retrospect, the abundant internal administration of cold water at a certain stage in fever, by Celsus, has been already mentioned, and will be again, under another head.

Boerhaave has also been spoken of as thinking highly of diluents, esteeming water as the greatest, but preferring them warm, "because," in his strange theoretical language, "cold water heateth more, because it rather fastens the stimulation; contrary to hot water." He recommends "diluters" in fevers, among other complaints. He also speaks of the use of the "steam bath" in fevers.

From the nature of the sthenic theory of Brown, we might infer, that in many fevers he could not approve of cold, and perhaps hardly of diluents at all, certainly in "fevers of the torrid zone, where indirect debility exists;" and of course in low fevers every where, he disapproved of affusion, and probably of free ablution. Of sthenic or inflammatory diseases, fevers included, he avers of cold, that "it is sufficient to cure them all."

In the work of Jameson already quoted, authorities

are referred to on the use of diluents in fevers, &c.; among them Dr. Huxham, who says, that in the "nervous fever" the patient should drink frequently; "though such quantities may not be necessary as in the ardent or even the putrid malignant fevers, yet they should be sufficient to carry on the work of dilution." A curious case is related by Beddoes (Hygiene, vol. ii., p. 48), illustrating the action of cold affusion in some cases. "On a journey into the Highlands, in 1787, the author happened to pass two nights at a small inn by the river Tummel. A low fever raged throughout the country, and among several persons ill in the house, a maid-servant was distinguished by the violence of her symptoms. It was the sixth day of her disease. The author, after examining her situation in the morning, ascended the Schehallien, and on his return was surprised at hearing that this girl was nearly well, all but weakness. In her delirium she had uttered a desire for water, which being withheld, she had crawled, during the absence of attendants, to the brink of the river, from which she immediately perceived a herd of cattle, with the drovers, at some distance, on their way to cross the bridge. The sight induced her to make for the water, in hopes of concealing her nakedness. She waded up to her middle, and leaned against a fragment of rock. Nor was it till one of the drovers turned his horse towards the inn, that she was discovered in this position; and it was believed that she

had occupied it not less than five minutes. Her delirium was gone, and the symptoms of fever had quitted her." Dr. Baynard, he continues, among other equally singular and apparently authentic examples, relates that of a young man ill of the small-pox, who escaped into a pond, and had his attack thus broken off.

In Abyssinia, according to Bruce, cold water, internally and externally, is commonly used in their violent fevers. In Egypt, they are said to use the cold bath towards the *decline* of the fever; which, in debilitating attacks, we could not suppose often safe, unless, as Dr. Bell remarks, we reflect that probably, in that climate, the water seldom falls, as a general rule, below an almost tepid condition. The Italians, at one time, made very free use of water, even cooled with ice, in fevers.

But early in point of time, as well as of interest and importance,—according to Currie, the first introduction to notice of cold ablution in Europe,—was its use in an epidemic fever at Breslau, in 1737, described by De Hahn. This author was himself attacked with the disease, and ascribes his recovery chiefly to this treatment. With other patients, also, he had considerable success, although, as Currie remarks, his use of the remedy was not governed by as safe rules as that of the latter. He continued the application of cold for a longer time, and employed it, as in his own case, so late as the fifteenth day of

the fever, and when the body was shivering and covered with cold sweat.

Of later date Dr. Reid, writing of fever, avers that "there is no method, so far as our observations have gone, which seems to exert so decided an effect in controlling the succession of morbid phenomena in the body as the action of cold water; and it is only to be regretted that popular prejudices are so strongly marked against it as to prevent its employment more universally." He never used it externally after the sixth day of fever, confining himself in the advanced stage to tepid sponging. Dr. Southwood Smith (on Fever, p. 411), in relating a case, where the cerebral affection was marked, and the general heat high, after large general and local bleeding, uses the language: "Recourse was had to a measure the efficacy of which is but little known and less appreciated; a remedy, the power of which is second only, if under some circumstances it be not even superior, to that of the lancet; a remedy which can never supersede the lancet, nor dispense with it, but which, when added to it, forms by the combination a treatment so powerful and efficacious, that it might render death, from the acutest cerebral inflammation, as rare as recovery is at present. This remedy is known by the name of the cold dash. It consists of pouring a column of cold water upon the head in a continued stream, from a height of from six to ten feet." He adds: "After the patient has been wiped

dry, which he should be as soon as possible, and placed in bed, the symptoms may soon return in all their violence. The same process will again remove them, and as often as the former recur, the latter must be repeated. Three or four repetitions will commonly suffice to subdue the most intense cerebral affection."

In fever of violent excitement, in warm or temperate climates, and when decided local complication is absent, McCormac (Methodus Medendi) approves of cold affusion. But in the more ordinary cases, he prefers cold or tepid aspersion. Jackson, he says, directs water to be taken fresh from the spring or open sea, and poured over the head and shoulders: but Frank the son has seen the surpervention of pneumonia from the careless employment of aspersion. Warm baths, again he remarks, are advised by some, but Frank and Omodei both discountenance them as productive of needless exhaustion and agitation. McCormac would resort to them after convalescence as a means of cleanliness. On ordinary occasions Roupell (on Typhus), considers cold affusion unadvisable, but advantageous at certain periods of the year, and in warm climates. As a modification of the plan, he prefers sponging, adhering to Currie's rule with regard to the temperature of the patient, and avoiding the general application of cold altogether where pneumonia is present, or the mucous membranes are inflamed. Yet its local employment,

he observes, may be allowable in certain instances. as when the serous membranes are inflamed, or the meninges excited. For the headache which is a very early symptom in typhus, he considers the local use of cold decidedly beneficial. Cold internally in the way of drink, is ardently desired, and may be freely allowed. "There can be no objection even to iced liquids in the early stages." "Nothing is more agreeable than cold water, or toast water, which is the usual beverage of my patients." Mackintosh, in continued fever, directs fomentations of the abdomen, and if the body be hot, sponging with cold or tepid water, as may be most agreeable to the patient. In inflammatory fever, he believes the prohibition of cold drinks to be injudicious, and that they may in general be allowed to gratify themselves in this respect. In a work on typhus, by J. T. Hernandez, who espouses the Brunonian theory, we find the following: "Les bains chauds comptent parmi les meilleurs moyens de traitement du typhus nerveux. Leur action est prompte et générale; mais il ne faut les employer qu'en temps opportun, &c." "Ils sont principalement très utiles quand une grande excitation spasmodique est répandue sur les systèmes lymphatique et dermoïde, dans la complication lymphatique de ce typhus, lors qu'on doit favoriser l'eruption d'exanthèmes aigus ou la rappeler, lorsque l'on veut amener des sueurs favorables et critiques. Leur utilité dans ces cas, est très grande, leurs bons effets sont très multipliés.

Ils seroient nuisibles lorsqu'il y a des obstructions anciennes dans les viscères abdominaux, des dispositions à des hémorrhagies utérines ou d'autres parties, des dérangemens gastriques marqués." (p. 430.) Marshall Hall, treating of "typhus fever," advises that the skin should be occasionally sponged with water or spirit, which should be used cold to the head, and warm to the extremities. He prefers giving drinks in small quantities, and repeating them frequently, to allowing large draughts "which oppresses the patient without removing the thirst, according to his experience." Says Dr. Christison on the treatment of continued fever: "Cold is an approved means of subduing excitement in the early stages; and it may be employed advantageously in many shapes; such as cooling drinks, cool air, and ventilation, cold affusion, cold sponging, the cold douche, and other modes of applying cold to the head." In continued fevers of every type, however, cold drink is longed for by the patient, and is properly allowed, but under two restrictions; first, that it shall be given in moderation at each draught, to prevent disorder of the stomach being induced;* and secondly, that when diaphoretic crisis seems to approach or has commenced, cold shall be exchanged for warm drink. "Patients," he observes, "in the

* Were all practitioners equally cautious with *tartar emetic*, as a febrifuge, more harm would be obviated than can arise from disregard of the above rule in the case of water.

early stage of fever, are extremely capricious in their choice of drinks, and the physician should be prepared to indulge them with variety. But when the first week is over, or even earlier, all medicated drinks are commonly loathed, and spring water and soda water alone relished." Similar to this is the experience of Dr. Chapman, who except when needed for diaphoresis, &c., particularly, discards the herb teas, formerly so constantly given, believing that, "*Cold water is the best drink in fever.*"

Doubting the general applicability of cold affusion, either for mitigating or cutting short reaction, Dr. Christison remarks, that cold sponging has with great advantage been substituted for it. By this, faithfully persevered in, he thinks there are few fevers in which the patient's comfort is not essentially improved. In case of deficiency or irregular distribution of heat or great nervous exhaustion, *tepid* sponging only is to be employed. He also speaks favourably of the cold douche of the head, wet evaporating cloths, and the ice bag. Dr. Graves (Clin. Lect. p. 320, &c.,) has some very sensible remarks on this subject. He believes that the cold affusion in fever, as recommended by Dr. Smith, and practised in the Charité Krankenhaus at Berlin, is a most certain and excellent, and energetic remedy, and regrets the want of apparatus for applying it: but, infers from the prejudice against it, caused by its abuse at the time when indiscriminately used in scarlatina, and from

the proper apparatus* being seldom at the command of the physician, that its utility must be at least for some time, limited to public institutions; indeed, in most cases, he thinks we may do very well without it.

On the whole, this is perhaps the most correct conclusion, as far as regards the cold affusion, although this in some cases must be a very useful remedy, cautiously and discreetly employed; but by no means could such an inference rightly be extended to cold and tepid sponging, or the local application of the *douche* (to the head, &c.).

Dr. Graves goes on to dilate on the difficulties attending the success of the application, even of cold lotions. These, he says, act as powerful refrigerants if constantly repeated, so as to keep the part below the standard temperature of the body. But instead of this, "the nurse applies the lotion and then perhaps drops asleep, &c., &c.," and in this way he thinks the heat of the part is actually increased by the *reaction*, rather than diminished. He consequently prefers fomentations, frequently repeated, of vinegar and *hot* water, to the temples.

The latter suggestion is interesting and useful.

* Very little ingenuity is needed to prevent inconvenience from want of *apparatus*. With a bath tub and hydrant provided, an old piece of tin pipe, a few square inches of India rubber, and an aneurismal needle, threaded with twine, to join the latter two together, a douching apparatus was obtained, to which the writer has been at times indebted, perhaps as much as to *any thing else*, for the enjoyment of perfect health.

though not at all, we should suppose, as a *general substitute* for cold. He observes that physicians employ warm applications for the relief of headache and cerebral symptoms, much less frequently than they ought. In some cases of determination to the head in fever, with intense headache, delirium, and restlessness, he affirms that cold applications will give ease; in others, most relief is obtained by fomenting the head with water, as *hot as it can be borne.* The idea of this was first communicated to him in 1833, by Mr. Swift, who noticed its value accidentally, while washing his face with warm water, at a moment when labouring under severe headache. He was induced to try it in the headache of influenza, with the most satisfactory results. In the influenza of 1833, in which one of the most remarkable symptoms was intense headache, accompanied by debility, and not amenable to ordinary modes of depletion, he found that *hot* water to the forehead, temples, and back of the head, gave great and almost instantaneous relief. Dr. Oppenheim of Hamburg had also discovered the same thing. Dr. Graves seems to consider this an entirely new practice; and I do not know that it was ever common, but I have found at least one instance where similar means had been used before.* It occurs in a work on blood-letting in fever, 1816, with cases, by Dr. Mills of Dublin, one

* Vide, however, aphorisms of Hippocrates, for the first.

of the physicians to St. George's Hospital. In the third case of his supplement, (p. 225,) the following prescription occurs; there had been restlessness and low delirium, &c. "Abradatur capillitium et foveatur caput *aquâ tepidâ* et aceto." The patient expressed himself relieved by it. It is singular how long the simplest remedial means may remain neglected, when if once revived, every one is ready to see its advantages.

Dr. Stokes approved of cold applications to the head in fever; with regard to drinks, he observes that there is sometimes a desire for cold, and at others for warm drinks. "You may allow the patient to drink cold water ad libitum. Many persons are afraid of doing this; but it never does any harm, and is a source of great refreshment to the patient." When there is great thirst and vomiting they frequently give ice in the Meath Hospital. "The remedy in fever," says Dr. S., "with gastric irritation, is of great value." Elliotson considers cold affusion proper when the temperature is steadily above 98° &c., but *not finding* these conditions in his patients, he only uses cold, and in some cases tepid ablution, with cold to the head, &c. Watson (Practice, p. 857) believes, that the cold affusion is not more effectual in *cutting fever short* than emetics; while it fatigues and alarms the patient, and where the vital powers are feeble may have injurious consequences. But the cold or tepid *sponging* of the surface, he

thinks, may be often of great use in abating the morbid heat, and soothing the uneasy feelings of the patients; the propriety of it being determined by the feelings of the patient, and it being best adapted to the most inflammatory, and least to the more typhoid types of the malady.* In Dr. E. Bartlett's late work on typhus and typhoid fever, (p. 309,) speaking of typhus, he says: "The agreement of opinion and practice, in regard to the external use of water at different temperatures, according to circumstances, is hardly less general than it is in relation to the necessity of purgatives. Dr. Percival used the cold affusion especially in the treatment of children; pouring several gallons of cold water from a bucket over the head and body, * * * * * perhaps the process of ablution or sponging has generally been preferred."† "Dr. Gerhard says, that by frequent sponging he found that he could regulate the heat of the surface with

* The name of Hufeland of Germany, is among the important omissions in the above. Vide, "Enchiridion Medicum." "Abundance of aqueous drink," is one of his essentials in fever. Dr. A. Billing, (First Principles of Medicine,) is another who approved of its external application, especially to the head, as of great consequence, in typhus. But to attempt to supply *all* would be a useless expenditure of time. Distinguished *instances* will be sufficient for our purpose.

† In an article on typhus, extracted in Bell's Bulletin, (December, 1844,) J. Burgess, surgeon, London, considers the cold affusion to have "a specific agency in stimulating and strengthening the capillary and exhalent vessels, and the vascular and nervous system, thus giving tone to the functions of the heart, &c., &c., and restoring transpiration."

great ease, and in some degree, also could moderate the cerebral symptoms." After mentioning Dr. Graves's preference of *hot* water fomentation, to relieve the pain in the head, and other symptoms of over-excitement in the brain, he remarks that it is in accordance with the extensive experience of his friend and colleague Dr. Dudley, in the similar treatment of many local affections of a painful or inflammatory nature. This practice, by the way, is supported by the analogy of many facts. In toothache, for instance, I am told that hot water to the face sometimes gives relief, like other counter-irritants, by determining the blood and excitement from the inflamed part to the skin.*

In connexion with the above may be mentioned the advantage derived in the practice of Dr. Stewardson, in the Pennsylvania Hospital, from wrapping the limbs, in typhoid cases, (when cold and prostrate especially, or deficient in perspiration,) in flannels wet with hot or warm water; and also Dr. Pepper's preference for sponging in typhoid or typhus, of the addition of solution of chloride of soda to simple water. Chomel used the same means, besides the internal use of the chloride.

We are told by Dr. Bartlett (p. 156), that in typhoid fever the most effectual refrigerant, in the hands of

* In some gastric diseases, also, practitioners have found fomenting the epigastrium with water as hot as could be borne, the best of measures. And see again Graves's Clin. Lect. p, 405.

Dr. Nathan Smith, consisted in the free use of water externally. He is very warm and decided in his commendation of this remedial measure. He says that there is nothing else so powerful in allaying morbid heat of the surface, in diminishing thirst, and in quieting restlessness and agitation. He directs the body of the patient to be uncovered, and then to be sprinkled, or dashed, repeatedly, with pure cold water. He allows cold water for drink, as freely as the patient may desire, during the whole course of the disease. In the opinion of Chomel, simple and benign cases of typhoid fever may be safely trusted, says Dr. B., to refreshing drinks, such as lemonade, currant-water, orange-water, or pure water, taken at short intervals, and in such quantities as the patient may desire; and besides other similar means, sponging the body with vinegar and water or cold affusions, if the skin is hot; cold applications to the head, when this is the seat of the pain, &c. Again (p. 164): To control the hemorrhage from the bowels, Chomel recommends iced water for drink, in injections, and applied upon the abdomen, &c., &c. With regard to the chloride of soda, externally and internally, he finally confessed, in the *Lancette Française*, that his hope of it had not been realized. Louis, in the same disease (B. p. 168), aided bloodletting by suitable drinks, emollient enemata, &c. Gum and Seltzer water "should be given in large quantities, as freely as the patient may desire." When the delirium is violent, he sees no ad-

vantage in the application of ice to the head. No mention is made of his having tried the cold douche, which Dr. S. Smith preferred to ice. It certainly has advantages over it; its effect is more easily regulated; and, according to the experience of Dr. Joseph Hartshorne, too long continued application of ice may produce *positively injurious* consequences in the brain.

The practice of Drs. Physick and Parrish was governed by the same moderate rules as the best of those above quoted. Perhaps, unless at a later period of his life, Dr. Physick was the more cautious in the use of external cold; but Dr. Parrish approved entirely of the principle, with the *restrictions* of Currie. And last, though very far from least, in the long catalogue, we may speak of the opinions and experience of Professor Chapman. His preference, as a general rule, for cold water as a drink in fever, has been mentioned. Besides the measures advised by so many authors, he insists, with more stress than any other I have met with, on the frequent value of cold enemata. Dr. Currie used and advised these. They were used I think by Dr. Hahn, at Breslau. Dr. Rush (Inquiries, vol. ii., p. 155) employed them in yellow fever. But comparatively few* treat of them

* Chomel has been mentioned before as recommending ice-water injections for the hemorrhage from the bowels in typhoid fevers. Dr. Williams, of St. Thomas's Hospital, Watson affirms to have at one time relied much on *warm* water enemata. Dr. E. Miller, of

at all. Even Dr. Holland, with all his appreciation of diluents, says nothing of their introduction by the rectum. They are, perhaps, less frequently applicable in continued than in the hot stage of intermittent and remittent fevers;* and there is always great caution needed, that they be never tried except where there is present *considerable vigour*, heat, &c.

Another point of treatment which Dr. Chapman approves, and which is not very frequently spoken of, is the application, when locally indicated, of cold, even ice, to the epigastrium. Dr. Bell, indeed, (Stokes's and Bell's lectures,) and some other authors, recommend it, and Dr. Graves does not see why cold should be so much *more* applied to the cranium than to the other great cavities of the body: he however approves most commonly of warmth to all. In a case of "vascular and nervous irritation of the stomach with convulsion," narrated by Dr. S. Jackson, in a journal of 1826, besides, after or *with* bleeding, cold affusion and cold drinks, which "called forth, from the patient, the most extravagant expressions of the relief they afforded him," there were also cloths dipped in cold water applied to the epi-

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New York, (North American Medical and Surgical Journal, vol. v., p. 145,) disapproving of active sudorifics, substituted water at various temperatures, and, among other modes, by injections into the bowels.

* Perhaps all these remedies are most demanded in the very hot fever which so often presents, even in common intermittent. Giannini was warm in commending this application of the cold affusion.

gastrium. He was convalescent in two or three days under this and a little other treatment. I have no doubt, from the obvious utility of it, that the application in question, of cold to the epigastrium, is much more common in *fevers* than would appear from the books I have consulted. Warm and hot water, in the form of fomentation, &c., to the same part or the abdomen, is a means which probably the great majority of writers would approve, when particularly indicated by the symptoms. The foregoing are but a very few, selected almost at random, from the host who have written favourably of the various uses of water in "fever" only. Would there be any advantage in running through even a similar course with regard to other diseases? None at all: it would merely spin out to unnecessary tedium, a discussion whose object has already been fairly gained. The following notices of authorities may, therefore, be still more brief.

CHAPTER VI.

Ablution in the plague—Yellow fever—Scarlet fever—Ice, &c., in cholera—Intermittent fever.

In the plague, which some consider only a modification of a high grade of fever, we need only mention in addition the practice of cold ablution, by Samoilowitz, (History of the Plague in Moscow, 1771,) and its recommendation by Drs. Falconer and Reid, among others, besides the earlier work of Dr. Hancock (Febrif. Magn., 1723).

In yellow fever, there is a variety of opinion. Currie, in his first volume, wonders that cold water, externally and internally, had not been resorted to in the fever of the West Indies, and remarks on the propriety, if it were, of using it in the *early* period of the attack. Before his second volume had been published, however, he heard of its being tried, and failing in Philadelphia, in the hands first of Dr. Stevens, and afterwards of Dr. Rush: he explains this by the incorrectness of the *principles* on which they acted. Dr. E. Stevens, of St. Croix, had proposed, in the fever of 1793, the cold bath every morning—

even in a state of languor and lassitude,—in combination with "the tonic plan in its fullest extent"—bark, Madeira, &c. In a printed letter to the public, the celebrated Hamilton, then Secretary of the Treasury, recommended this treatment highly, from experience in his own case. We may well question, however, the certainty of his practice, who, while warning against "debilitating applications, or profuse evacuations in any period," speaks of the cold bath as of the *same class* of remedies as bark and wine.

Dr. Rush, (Inquiries, vol. ii. p. 126,) the day after his interview with Dr. Stevens, adopted his *whole* treatment, and with this result: "Three out of four of my patients died, to whom the cold bath was administered, in connexion with the tonic remedies before mentioned." He concluded, therefore, that these means were not more effectual than others previously used, and abandoned them. Yet (p. 130), in the treatment which he afterwards adopted, and by which he endeavoured to remove the fears of his fellow-citizens, "assuring them that the disease was no longer incurable;" although in place of *tonics*, he had substituted *blood-letting*, *purging*, and *low diet*, the only other essentials were cool air, *cold drinks*, and *applications of cold water* to the body. And again (p. 155), he speaks of cold water, by means of napkins to the head, and clysters to the bowels, as a most agreeable remedy in this disease. It was, says

he, by suffering the body to lie for some time in a bed of cold water, that the inhabitants of the island of Massuah (Bruce's Travels) cured the most violent bilious fevers. The vapour bath also, Professor Chapman informs us, was found of service in the yellow fever in this city. In a late epidemic at Gibraltar, cold lotions were used when the skin was hot. Of those who approve of cold affusion or sponging in yellow fever, there need further be named only Larrey, Marshall Hall, Mackintosh, Shapter. Louis inquires whether "some disturbing means might not be employed in the first period, when the heat is considerable, such as cold baths or cold affusions; and if, in the second period, when the temperature is diminished, and becomes below the natural heat, a hot water or vapour bath might not be advantageously used." It should have been mentioned before, that in the cold condition of "congestive fever," the vapour bath is among the means recommended.

In scarlatina, according to the rule of temperature, whether of Currie or of Fröelich, we might expect greater immediate effects from the cold affusion than in almost any other disease. But here a point presents itself which causes a division among practitioners: we mean the *eruption*.

Currie had no doubt of the safety and efficacy of the practice, having cured two of his own children, and a number of others, by pouring buckets of cold

water over them, repeated as often as the heat of the skin returned. With his caution and skill there might be little to fear from it. But as one instance of the effects of its abuse, I was informed by Dr. Ashmead, that when in Paris, he attended, with Louis, a nephew of Dr. Currie, in this disease. He insisted on the cold affusion at a time when they considered his condition unfit for it: it was tried, and the fever left him, but he was attacked with an affection of the chest, of which he died. They both believed him the victim of the ill-timed remedy.

There is no doubt that, as Dr. Graves remarks, its indiscriminate use, soon after its introduction, produced consequences from which arose a strong and very natural prejudice against it. Yet many authors recommend at least cold or tepid ablution, some even the extent of Currie's plan.

Blackburne (1803) believes that cold affusion and emetics give relief "in the same or an analogous manner." Marshall Hall, however, thinks the experience of the profession has not sustained the expectations formed of its effects. Of others, we may remark, that those already quoted, as authorizing it or ablution in continued fever, are still more emphatic and bold with it in scarlatina; and in addition, Stiebel, Reuss, Barry (Esculap. Monitor), Bateman, Barthez and Rilliet (Maladies des Enfans), and, mentioned by the latter, Nasse, Petz, Gregory, Kolbang, Kressig, Harder, Martius, Albers, Thaer,

Henke, Caron d'Annecy, &c., &c. "Le docteur Horn," say Barthez and Rilliet, "présent les affusions froides sur la tête tandis que le malade est dans un bain tiède." Although, with Henke, they reserve such energetic means as the general cold affusion for *epidemic* cases, and where there is intense heat, dryness, &c.,—yet they state that "les affusions froides sont bien mieux indiquées que la saignée chez les enfans."

Might not diluents* be particularly useful in this affection? It was thus that Hancocke employed the element, giving instances in his book of the efficacy of cold water internally to "restore repelled eruption, or to bring on sweat;" and his idea appears to me a valuable one. Taking it in connexion with Dr. Holland's remark, of the alimentary canal being to all intents a *surface*, as well as the skin, why should we not as much anticipate that cold would "drive" eruption from one as from the other? And when, from any cause, it has been transferred to the *internal* surface, why should we not apply this means to "repel" it to the outer?† Without reference to

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* In a paper in one of the journals, a few years ago, Dr. Jackson, of Northumberland, recommended highly the internal use of *ice* in scarlet fever.

† Hildenbrand advised drinking *warm* fluids in typhus, "with a view of throwing out the eruption." This mode of action is contradictory to the above, and suggests the reflection, that in such a train

such a rationale, Dr. Holland believes that a freer employment of diluents than is commonly adopted might be beneficial in exanthematous diseases.

In measles, among the most interesting were the experiments of Dr. Thaer with cold affusion, in the neighbourhood of Berlin, in 1825. Whether any thing beyond cold or tepid ablution, in this and similar affections, can ever be universally adopted, is very doubtful. The catarrhal symptoms in measles, for instance, form an item for consideration and hesitation. In small-pox, Boerhaave recommends "diluters," "to repulse the spiculum of stimulation," as in other "inflaming distempers." Baron Dimsdale advised his patients to drink cold water "after inoculation with the vaccine virus, till the eruption is completed." Although, in this disease (variola), some, as Currie, are in favour of free affusion (he, however, also giving cases of its failure), and others, as Reid, of its cautious use, yet perhaps the majority avoid it, at any low degree of temperature. In their account of the epidemic in Philadelphia, in 1823 and 1824, Drs. Mitchell and Bell report that on trial, in no case had they reason to be satisfied with it. The state of

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of reasoning we are very apt to err, by forgetting the close *sympathy* which exists between the inner and outer surface. It must depend upon circumstances whether coaction or metastasis takes place between them.

To bring back repelled eruption is, by the way, one of the most valuable applications of the *warm bath*.

the skin, they say, during the vesicular and pustular stages, is such as to prevent its transmitting the usual impressions. They infer that, if at all useful, it must be in the forming stage. The same objections do not hold, however, in their opinion, against the internal use of cool or cold liquids.* The experience of Dr. J. Hartshorne, also, amongst others, is against the use of cold affusion, or any thing beyond tepid sponging, in this disease, as well as in scarlatina; the danger of injury to the brain or lung being thereby increased.

A very interesting question, is with regard to the use of cold and hot water, ice, &c., in cholera. Hoffmann mentions a very severe case, which was cured, after other treatment had failed, by large draughts of cold water. Before this, Sydenham, in the epidemic of 1669, and Morton also, used large quantities of warm chicken-water, by the mouth and rectum. In the attacks of this century, in India, especially the hot bath, was by many found serviceable; while in Russia, except at Moscow, neither the internal nor external use of water attracted much favourable attention. In Germany,† France, and this

* Says Tooke (View of the Russian Empire), "all eruptive diseases are abated by bathing, consequently, then, the small-pox; and if this dreadful disorder be actually less fatal in Russia than in other countries, this phenomenon need not to be attributed to any other cause than the vapour baths."

† With Hufeland, calomel and cold water were *the remedies* after venesection and an emetic.

country, ice and cold water were much given, and, says Dr. Brigham, "frequently with most happy effects, snatching the patient as it were from the grave." In Dantzic, however, in 1831, according to Dr. Hamett, draughts of cold water, in insatiable thirst, were allowed by one physician only; and a fatal case is mentioned, where they appeared injurious. Like many other means, ice became the boasted *specific* with some, and, with other specifics for cholera, when alone depended on, failed. But the French made very free use of iced drinks. J. F. V. Broussais, in his two lectures on cholera, speaks thus: "You will ask me, perhaps, how the want of ice may be made up? I answer, that nothing is so good as ice; nevertheless, I think that small draughts of cold water may be of use;" artificially or naturally produced, "ice must be procured, if possible." Similar means were used in this city. "Drink," remarks Dr. Chapman, in his letter to Dr. Tyler (on the Cholera, 1832), "is sometimes vehemently solicited, particularly in the height of the attack; and the instinctive desire for cold water, or even for ice, may be gratified in moderation." Pieces of ice held in the mouth, or swallowed, were often found to give the greatest relief.* And still more curious, as we are

* "Also water as hot as can be borne," says the report of Drs. Jackson, Meigs, and Harlan, "has been extolled in cholera."

informed by the same authority, *frictions* of *ice* externally were sometimes found decidedly useful. He has seen them almost without pulse, with perspiration all over, and the largest barley-water-like discharges, while intolerant of every thing heating or stimulating, yet reacting on being rubbed along the spine with large cakes of ice.

Certainly, in legitimate connexion with our subject, is the topic of injection into the veins in cholera. However essential the saline constituents, the restoration to the blood of its exhausted *fluid*, would, *if attained*, be of still more vital importance. Considering the now prevalent veto against the practice, we cannot but be surprised, as well as interested, by the results obtained in the Drummond Street Hospital by Dr. Mackintosh. Saving "of the really collapsed or blue cases," 1 in $6\frac{6}{25}$, as he believed, by injection, while without it, only 1 in 12 or 20 recovered, he concludes, that "should I ever have charge of cholera patients again, I shall, profiting by the experience I now possess, use the saline solution at an earlier period of the stage of collapse, nay, at its commencement." He details, however, many precautions necessary in the attempt, having found some of the first trials fatal, by the introduction of solid saline particles, or even of *threads* of the *straining linen*. In this city, the practice utterly failed.

In 1799, Drs. Chapman and Lee instituted a series of experiments on animals, in which they could dis-

cern no difference in the effect of several articles injected into the circulation, all seeming to act merely as extraneous matter, producing great distress, &c.

Drs. Lawrence, Coates, and Harlan, also experimented, apparently with different results. Such were also obtained by Hunter, Sir E. Home, Orfila, and Magendie. Lanzoni (1689), having cured a mangy dog by injection, speaks of the operation as "difficilem quidem ac fere periculosam," but "non fugiendam."

A part of the means above-mentioned in cholera, reminds us of what has been similarly done in intermittent fever. In the cold stage, it is not uncommon in Persia to use friction with ice. In India, the surgeons of the British army have tried cold affusion with "reputed advantage." Besides the opinion of Giannini, and others, in favour of this measure in the hot stage, and the common practice in Egypt and other places, we have occasionally on record signal instances of its use.* Thus in Aubrey's Lives and Letters from the Bodleian Library, the following: "Dr. Butler, lyeing at the Savoy, in London, next the water-side, where a balcony looked into the Thames, a patient came to him, that was grievously tormented with an ague. The Doctor orders a boat to be in readinesse under his windowe,

* When the disease has become chronic, some practitioners have found cold bathing, "even the intensely cold water of the Yellow Springs of this state," to break it off. Sea-bathing is also excellent.

and discoursed with the patient (a gentleman) in the balcony, when, on a signal given, two or three lusty fellowes came behind the gentleman, and threw him a matter of twenty feet into the Thames. This surprise absolutely cured him."

CHAPTER VII.

Inflammations—Hemorrhages—Tetanus—Mania—Warm bath in spasmodic complaints—Asphyxia—Cynanche—Chorea—Use of moist air—Hemorrhoids—Use of mineral waters, by M. Dupasquier.

We need not spend many words on the uses of water in inflammations and inflammatory affections. Cold or warm, internally or externally applied, in meningitis, gastritis, enteritis,* ophthalmia, in short, in *all* of this class,† they are universally acknowledged and felt. As instances, perhaps under this head, we may name the frequent advantage of hot baths‡ and

* E. g. cold enemata in dysentery.

† See North American Medical and Surgical Journal, vol. vi., No. 12, for a severe case of "puerperal peritonitis cured by ice." As regards *ophthalmia*, the writer is a daily instance; having been for several years almost literally *unable* to read for two hours consecutively, without every few minutes applying a cup of cold water to his eyes, which are in a state of chronic inflammation, or "weakness;" while with the constant refreshment of such means, he is able to continue moderate study.

‡ I have seen several remarkable instances of the success of the hot bath in chronic rheumatism in the practice of Dr. G. B. Wood, in the Pennsylvania Hospital.

local hot douches in chronic rheumatism; the hot pediluvium to bring back displaced gout, &c.

And a similar statement may be made with regard to hemorrhages. No one doubts the value of ice and cold water in many of these. In hæmoptysis, it is a question whether we may safely apply ice to the chest, or even place the feet, as some do, in very cold water; but still, pieces of ice held in the mouth, and dissolved slowly, prove very beneficial.*

Of affections of the nervous system, tetanus is the one on which, in connexion with this subject, the most interesting discussion has prevailed. When idiopathic, "in the middle of summer, and in a robust young man," in the opinion of Hippocrates, the aspersion of large quantities of cold water may be salutary. Avicenna, Schenkius, and Jason, are also stated to have approved of it, before the time of Dr. Lind, of Haslar, Dr. Wright, Dr. Cochrane, and Dr. Currie, to whom its revival is due. The latter met with remarkable success with the cold bath in idiopathic tetanus; in the traumatic, less satisfactory. Dr. Rush (Inquiries, vol. i.) thinks it probable that intense cold might cure tetanus, having known of such effect being produced in a horse. Baron Larrey records a case in which it caused exacerbation of the spasms, ending fatally: and others have oc-

* Martin Ghisi, says Prof. Chapman, has checked the most profuse hæmoptysis by a repetition of a cup of iced water every *fifteen* minutes; and similar has been Prof. Chapman's experience.

curred, as one in St. Thomas's Hospital, related by Mr. Morgan, where the *prostration* was immediate, and not followed by reaction. Sir J. McGregor, in the Peninsular war, thought it "worse than useless;" but gives a case where exposure to rain and snow, &c., was followed by recovery. Sir B. Brodie is said to have cured seven in twelve by cold affusion. Curling asserts that, on the whole, in traumatic tetanus, it appears to be of little avail; while in the idiopathic, no other remedy except opium would appear so well adapted to control the spasms. Abernethy, having seen the effect of snow on a tetanic horse, avers that he would wish it tried if himself attacked.* The warm and vapour bath† have been also recommended, especially in the more chronic form.

Cases of convulsions‡ of various kinds have been

* In the Nouvelle Bibliothèque for March, 1828, three cases of traumatic tetanus were given, cured by cold affusion. With others, quoted as sanctioning the practice, are the names of Cullen, Fournier Pascay (Dic. des Sciences Medic.), Dr. Harris of Pennsylvania (New Med. Repos., vol. iii.), &c. &c.; also, Hunter, Stultz, Darlyng, Heurteloup. In the Pennsylvania Hospital, many years ago, Dr. J. Hartshorne saw it tried; the conclusion there being that no positive advantage was derived from it.

† Vide a paper by Dr. H. Marsh, in the Dublin Hospital Reports, vol. iv., p. 567.

‡ In hydrocephalus, "even when coma or convulsions have come on," M. Hall names as recommending highly the cold douche, Formey, Darwall, Abercrombie, and Schmidt. My excuse for such a lengthy agglomeration of names is, the *object in view;* which is, as already repeated, to display how false must be the assertion that the uses of water have been neglected by medical men.

narrated, in which the external application of cold water or ice was beneficial. We meet with one quoted from Hoffman, where its internal use had the same effect. It was that of a boy, in whose treatment "data, tam ex illorum scientia anthelmentica, quam ex horum præscripto antepileptica, adhibitis simul balneis, fuerunt prorsus frustranea. Malum potius perstitit idem, quin subinde factum acerbius. Tandem miser aquam fontanam frigidam, ad unam vel dimidiam mensuram, quotidie per vices bibere jussus est. Quo intra 14 dies motus isti convulsivi paullatim compositi, nec in hoc usque tempus iterum infestarunt." In the course of the last year something similar occurred in this city, in a lady with an acute disease, the mitigation of whose violent nervous symptoms was principally ascribed to frequent and free draughts of cold water.* In the restlessness of fever, experienced physicians have seen great relief from allowing the arms (or an arm) to lie in a basin of it.†

The cold bath more seldom, the warm bath often, have been noticed as useful in *mania*. In this the cold douche to the head is sometimes the most valu-

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* See also Coffin on Bathing, p. 39, where two cases of morbid wakefulness are given (reported by Dr. Gibney), relieved by tepid bathing (82°, the Buxton Bath).

† The uses of the *hot pediluvium* are among those whose familiarity, with our want of space, cause their being here entirely overlooked.

able remedy to be obtained. And in most cases of cerebral excitement and hyperæmia it is so powerful that it is a matter of surprise not to find provision for it in every public institution, for the treatment of the diseased and injured.*

To relax spasm, the warm bath is frequently of service. And by the relaxation which it tends to produce, and its general soothing properties, it is among the most essential of the means possessed in painful affections of the urinary organs,† and also in the passage of gall-stones, &c. But, the uses of the warm bath, as has been observed, it would be vain to attempt to enumerate. Of the other modes‡ of applying water, indeed, the uses above given are but a few of the most important; with some additions they will be, however, sufficient for our purpose.

In the intervals of *asthma* the cold bath has been highly recommended. Particular applications§ in

* On the value of the douche and shower bath, &c., vide McCormac, Pinel, Esquirol, &c. A recent work, however, by Pinel, and a report by Dr. Conolly, of Hanwell, tend rather to lessen the received idea of the importance of the douche in treating insanity. See Medico-Chirurgical Review, January, 1845. Conolly prefers the shower bath, and rates its utility highly.

† In the Western Journal of Medicine and Physical Sciences for July, 1828, is a case of ischuria, successfully treated by *cold* affusion. Currie relates a similar one.

‡ Of the vapour bath a very small proportion is noticed; the detail would be entirely superfluous.

§ The use of the hot foot-bath in this and analogous affections, in hypertrophy of the heart, &c., is familiar.

the paroxysm cannot now detain us. Dr. Graves, in the *influenza*, preferred fomenting the trachea and chest with very hot water, as more serviceable than blisters. This, he says, proves extremely valuable in this as well as other affections of the air-passages; "and on referring to the late American journals, I find that the plan of treating croup in its onset, by means of very hot water applied with a sponge to the throat,—a plan which I recommended some time ago in the Dublin Medical Journal,—has been extensively employed in America, and with the most happy results." On the other hand we have this, taken not long since from the Journal of Health by a weekly paper, as a *recipe*. "If a child is taken with croup, instantly apply cold water, ice-water if possible, suddenly and freely, to the neck and chest, with a sponge. The breathing will almost instantly be relieved. So soon as possible, let the sufferer drink as much as it can; then wipe it dry, cover it up warm, and soon a quiet slumber will relieve," &c., &c. Surely a most dangerous "recipe" for general distribution or general application, however, in some few cases, it might be beneficial. Never, in view of such medical precepts, let the Hydropaths boast of novelty in their measures.

How best to treat the "asphyxia of new-born" infants, has been the theme of considerable inquiry. Without pursuing it, we will merely incidentally quote a recent paper, by Dr. R. Doherty (Braith-

waite's Retrospect, No. ix., 1844). From his own experience of its good effects, he gives full assent to the plan of M. Hall. This is to alternate the dashing of cold water with the warm bath. In advocating this he observes, that he differs from Edwards of Paris and Scholler of Berlin.

Dr. Macartney has met with "remarkable success" in the treatment of cynanche tonsillaris by the frequent use of a gargle of iced water. (He has also found ice to be effectual in "stopping obstinate hiccup, when all other remedies had failed.") The same means appeared successful, a few years ago, in the case of a young man named Babcock, of Rhode Island, with "putrid sore throat." It had recurred at intervals for many years, in each case going on to suppuration, in spite of a variety of medical treatment, and, among other things, having his tonsils extirpated. At last, Dr. Jackson, of Boston, advised him to bathe his neck, throat, and chest every morning with cold water, and use it also as a gargle frequently. He recovered entirely.

Crampton, Stiebel, Dupuytren, and Rufz, according to M. Hall, record cases in which the cold bath, especially in the form of douche, was evidently of decided advantage in chorea.

In pleuropneumonia, bronchitis, whooping-cough, and "crowing respiration," M. Hall (Lancet, 1844), thinks highly of the utility of a regulated warm and *moist* atmosphere. The moisture he maintains by

pans of hot water (180°) at the foot of the bed, within the bed-curtains. He mentions several cases illustrating the benefit derived from such means. "The aqueous vapour constantly rising into the air from the sea is another favourable circumstance," says Guastalla of Trieste (Lond. and Ed. Journ. Med. Science, May, 1844), "rendering it fit for respiration in a number of diseases, which we know are aggravated by breathing a drier air." He remarks, that "it has been proved by Berzelius, that the air of the sea-side contains no acid or salt in combination with itself, and that the vapours rising into it are purely aqueous." All other ingredients he supposes to fill the air merely by the agitation of the waves, &c.

As to local applications in *erysipelas*, we have not time to enumerate opinions. Hippocrates advised cold for "erysipelas without ulceration," considering it injurious where the latter existed. Of the moderns, some prefer warm, others cold, and others again, as Reid, believe tepid water the best local palliative.—A very just caution of Dr. Bell's here happens to come to mind,—that it is an error to suppose that in all diseases of the skin, the warm bath may be promiscuously used; although there are very few in which, early or late, it has not been advised by authors.

Although hemorrhoids should perhaps more properly come under another head, we may here men-

tion Lisfranc's mode of treatment. Opposed to operating for this affection, in most instances, if diet, exercise, and venesection fail, he has recourse to a shower-bath on the parts affected, of Baréges water, or pure water, at the temperature of 68° Fahr., and an injection into the interior of the rectum. By this means, says he, "if I do not succeed in obtaining a radical cure, at least I soothe the patient's sufferings."

In the posthumous works of M. Pouteau, of Lyons, the drinking of "frozen" or cold water is recommended as a cure for scirrhous and cancerous tumours, no other aliment or medicine being allowed for some weeks; a case being also related, where Madame Girard obtained a cure of a scirrhous uterus particularly by this means, after all other resources had failed. He advises the extirpation of any external cancer, although attended with a cancerous disposition of the viscera, believing that the internal malady will yield to this treatment. This, of course, is extravagant.

Analogous to the above, in view of the opinion of high authorities already quoted with regard to the action of mineral waters, we may consider a report by M. Dupasquier, in the Clinique des Hôpitaux de Lyon (vol. ii., p. 451), of the effects of "bains et douches d'eaux minérales artificielles et naturelles." Certainly, in external application, the amount of other ingredients cannot modify much the action of the

water itself. Amongst the affections in which he says they have proved beneficial, within his knowledge, are "plaies fistuleuses," "engorgements articulaires très rebelles," "tumeurs blanches et les luxations spontanées;" which he thinks is "surtout remarkable;" "les fausses ankyloses, les engorgements des membres survenus à la suites de chutes, et les retractions musculaires;" "les affections rhumatismales chroniques, la paralysie rhumatique de Sauvages, les différentes neuralgies, et particulièrement la sciatique;" "les hémiplégies et les paralysies" dependent on "une inflammation chronique de la moelle épinière, ou à un affoiblissement nerveux;" "les maladies scrofuleuses" "presque toujours améliorées;" also "rachitis," "les déviations commençantes de la colonne vertébrale," "maladies vénériennes," "les dartres, et les autres maladies de la peau;" and, again, in chronic affections of the mucous membranes, abdominal engorgements not febrile, chlorosis, leucorrhea, and "l'affoiblissement produit par l'onanisme ou les pollutions involontaires." Even, also, to promote the absorption of tubercles, and, preceded by other treatment, in uterine affections, as chronic inflammation of the neck of the uterus, and scirrhus.

CHAPTER VIII.

Intestinal obstructions—Application of water to obstetrics—Extensive cupping.

We may now turn to an instance where the *mechanical* action of water is useful. In his Elements of Physics (p. 506), Dr. N. Arnott* observes that "It is now ascertained that fluid may be safely injected, even until it reach the stomach. Perhaps few, if any, cases of obstruction could resist the gentle force of penetrating water, and if so, a mechanical remedy of certain effect may in many cases be substituted for the drastic purgatives and pernicious bleedings now used, and often used in vain." For introsusception of the bowels, he says, "a copious enema, such as we have described above, is almost a certain cure. The liquid advances until it reaches the part where

* The value of this gentleman's "water-bed," to avoid pressure on tender or excoriated parts, is familiar to many. In the case mentioned, however, without pressure from without upon the ilio-cæcal valve, to open it, it is doubtful whether liquid could be made to pass through it from below.

the portion of gut has been swallowed by the gut below; and as it cannot pass without pushing the introsuscepted portion back to liberty, it effects the cure." On this the American editor, Dr. I. Hays, remarks, that "this can only possibly succeed very soon after the introsusception has taken place. After a time, inflammation occurs, and adhesion," &c., must oppose it.

In a number of the Lond. Med. and Phys. Journal, a case is narrated, as occurring in the practice of Dr. Alexander, of Genoa, which, presenting all the symptoms of strangulated hernia, and on the twelfth day not having yielded to any of the usual remedies, was rescued from death by injecting more than a pint of warm water through a long hollow urethra-bougie into the bowels. It was at once followed by a large feculent fluid evacuation, attended with instant and complete relief of all his symptoms. Dr. Epps, in the Lond. Med. and Surg. Journal, gave also the case of a gentleman who had taken, for obstinate constipation, calomel to salivation, saline draughts, manna and rhubarb mixtures, and castor-oil, but all to no purpose. After sixteen repetitions of common barley-water injection, the bowels were opened, and he recovered. And Dr. F. Bache records a remarkable case of obstruction of the bowels, happening in the Philadelphia Prison, in which convulsions and stercoraceous vomiting were present, the latter pretty regularly for weeks together, and

yet finally recovering: in his review of the treatment, he mentions "injections of warm water, to act by its *quantity*," as having been prominent among the advantageous measures. Other instances of this may be easily found, as in the N. Am. Med. and Surg. Journ., vol. ix. p. 208.

One of the valuable services rendered by water, is the aid it lends in combating the effects of some poisons. And in this we do not have reference only to its diluting power, and its action in washing out the alimentary canal. As a vehicle for temperature, as affording a shock, &c., it is almost equally important. It has long been known, that dogs which have been stupefied by the exhalations of certain grottoes, are immediately restored by the application of ice. In a similar manner, we are told, it acts on the torpor produced by inhaling irrespirable gases. After taking cyanohydric acid, eight experiments upon dogs with cold affusion proved perfectly successful in the hands of Dr. Herbst. "The certainty of success," in his opinion great, he remarks to depend "greatly upon the early employment of the remedy," although even late, it sometimes proved successful. Orfila confirms his results, adducing additional experiments, where the animals had taken enough to cause death if let alone. And at a meeting of English chemists, held at Sunderland, Dr. Robinson performed some very remarkable trials of a similar kind. Rabbits, which had dropped down as if dead

on the application to their tongues of four drops each of prussic acid, on cold water, in which was saltpetre and salt, being poured on their heads and backs, were instantly resuscitated, and soon as lively as usual. This was repeated with the same result by M. Lonzet, Professor of Chemistry, at Brussels. Their consequent expectations have been since realized, as I have understood, in the human subject. In the Med. Examiner, for Aug. 15th, 1840, an account is given of the treatment of Dr. Miroff, of Russia, for bites of mad animals, in which the Russian vapour-bath is an important part, and which terminated favourably in a number of instances. Many examples are on record of the success of cold affusion after poisoning by opium: e. g. one by Dr. J. F. Brown, of Tennessee, (N. Am. Med. and Surg. Journal,) and one by —— Barlow, of Oxford (Bulletin of Med. Science). The latter considers this an instance of the "excellent effects of cold water, when applied to the skin, in stimulating the incident nerves." When dashed on a narcotized patient, he says, "the nerves of the skin are made to play that part, which, under ordinary circumstances, the vagi nerves perform, (through the stimulus of carbonic acid,) and so life was continued." It occasionally happens, Dr. Bell observes, that a sudden alternation from cold to hot applications, and from hot to cold, will be more beneficial than a continuance of either alone; exemplifying Dr. M. Hall's remark, "that it

is not the mere application of cold, but the sudden application of *cold* to a *warm* surface, which is the effectual means of exciting respiration. It is the *sudden alternation*." Dr. Currie details the recovery of a person from the effects of opium by hot affusion.*

Even in obstetrics a little time would suffice to gather proofs of the appreciation by practitioners of the subject of our study. But we cannot dwell long upon them, however familiar and valuable some of them may be. It was proposed by M. Mojon, to inject the vessels of the placenta with fluids to promote its expulsion when retained. A successful trial of this by a Dr. Hoffmann, is quoted from Rust's Magazine. The practice exciting attention, "a long essay, including the detail of cases, was presented to the Medical Society of Paris, at its meeting in January, 1828, and was reported on very favourably by MM. Duchateau, Chailly, and Gendrin. The reporters observe that the author, M. Legras, "has endeavoured to restrict himself to actual experience, and he appears to us to have demonstrated by facts the safety in all cases of injections into the vessels of the cord after the birth of the infant, their efficiency in causing a separation of the placenta, in arresting

* The dashing of buckets of cold water over the body has also been repeatedly found successful in restoring those who have been struck down by *lightning;* as well as in the reduction of strangulated hernia.

hemorrhage from a partial detachment of this body, and finally in stimulating the uterus in cases of inertia of this organ." "If a few ounces (say 3vi.) of fresh water be adequate for the separation of the placenta in ordinary cases, it would be imprudent to trust to this quantity in dangerous hemorrhages from partial detachment of the placenta with absolute inertia of the uterus. In such cases, we should rapidly fill and distend the placental vessels, so that the cold and styptic fluid should be driven even to the uterine surface by forcing it to exude (?) from the placenta."

An account is given in Bell's Bulletin, for September, 1844 (extracting from the Medical Gazette), of a measure used by an eminent "veterinary professor," named Dick, in the vicinity of Edinburgh, to facilitate difficult parturition in a cow. At his suggestion there were thrown into the uterus six or eight quarts of tepid water, the hind-quarters being elevated; and, although having before suffered for twenty-six hours in vain, the animal was then speedily and safely delivered. This fact being communicated to a neighbouring surgeon-accoucheur in large practice, he resolved to try the plan upon proper human patients, and accordingly did so, "with complete success" in one case, in which "nothing else but the long forceps could have effected the delivery;" and in another, where turning and delivery by the feet would have been indispensable to save the patient's life. About a quart of tepid water

was injected in each case. As one of the numberless appliances, on the same principle as the general warm bath, though without its inconvenience, we may mention the practice recommended by some good obstetricians,—I think Lee among the number,—of holding cloths wet with hot or warm water to a rigid perineum in parturition. On puerperal peritonitis, we refer to the general assertion made with regard to diseases attended with inflammatory action. Armstrong, says Hey, remarks on the use of cold affusion here by Hippocrates, and believes that if at all admissible, it can only be in the first stage. He prefers fomentation with water as hot as can be borne. Lee considers the practice of injecting warm water into the vagina, highly recommended by Recolin, Dance, and Tonellé, serviceable, not only by washing away putrid matters, but by relieving irritation and inflammation, and to have not yet received all the attention which it merits.

Before concluding this sketch of medical applications, we may notice, by the way, an interesting little apparatus. A book was published in 1803, by Ralph Blegborough, giving an account of an "air-pump vapour bath," intended to combine the effects of cupping with those of the contact of vapour, either of water or of other substances; with cases of gout, rheumatism, palsy, cutaneous disease, &c., &c., in which it had afforded relief. The plan is an ingenious one, and might be developed into something

useful. Partly analogous was the substitute proposed by Dr. N. Arnott for bleeding; viz. extensive dry-cupping, by means of an apparatus which he suggests. Although thus known before, we find that this same idea of extensive dry-cupping recently obtained in France the Monthyon prize for its so-called "discoverer," M. Tunod (Braithwaite's Retrospect, 1844). This, however, is a digression.—We may now say a *very few* words on the uses of water in Surgery.

CHAPTER IX.

Uses of Water in Surgery—Wounds—Fractures—Water-dressing—Dislocations—Hernia.

VERY early, as we may suppose, was water applied in the treatment of injuries.* We even find Homer quoted; thus (Iliad, book xi. line 845) of Patroclus and the wounded Eurypylus:

> Ὀξὺ βελος περιπευκες ἀπ' αυτοῦ ὀ' ἁιμα χελαινον
> Νιζ' ὑδατι λιαιρῷ. ἐπι δε ῥιζαν βαλε πικρην,
> Χερσι διατριψας ὀδυνή-φατον, ἥ οἱ απασας
> Εσχ' ὀδυνας· το μεν ελκος ετερσετο, παυσατο ὀ' αἱμα.

Yet, however to be accounted for, the use of such means appears to have died away, and to have commenced again, in *modern* times, in France. M. A. Blondi wrote on it as a new treatment for gunshot wounds, in 1542; but the superstition of the times, and love of the marvellous, caused the rejection of so easy and natural an application. Soon after, Am-

* Hippocrates is said to have discerned, by the inscriptions in the temple of Esculapius, that his priests had used water, mixed with secret ingredients, to humour the superstition of the people. Vide again Macartney and Bell for historical facts.

brose Paré became convinced "that water is a good remedy in wounds and injuries;" but was justly indignant at the mysterious mummery with which others accompanied its use. Fallopius, of Venice, and Felix Palazzo, of Trebia, with Jaubert and Martel, of France, exerted themselves in its favour, with partial and temporary success.* In the warm climate of Italy nature prompted its continuance. The cure, by the free use of water, of a wound in the hand, which occurred to the Duke of Orleans, attracted the attention of Europe, about the same time that Lamorier wrote his essay "on the use of common water in Surgery." In spite of these, however, as well as Bonneker, Lancassani Caldani, and others, it fell into neglect for several years. In 1780, Danter renewed the subject, in an essay which Dr. Bell pronounces valuable, and mentions to have been aided by fortuitous incidents occurring in June, 1785. At that time Pichégru and several other soldiers, variously wounded, were placed under the care of a miller of Alsace, at his urgent request and assurance of cure. His treatment was with ablution, linen, lint, and certain magical-muttered words. The French surgeons adopted the former, and, aided by proper posture and splints, found it a very successful practice. Percy made liberal use of it in different campaigns

* The latter obtained the formal sanction of the University of Montpelier.

of the French Revolution.* Larrey did the same with the waters of the Nile in Egypt. Professor Kein, of Austria, is also spoken of as claiming without reason the merit of having originated the treatment. Macartney acknowledges that he did carry out the principle farther than those who preceded him. The latter (Macartney) affirms, and apparently with correctness, that he himself was the means of introducing it into Britain (on Inflam., p. 188). Breschet, Josse, and Berard, within a few years, revived the practice of irrigation, in France. I am told that Lisfranc is also partial to it, as well as Chaumet, of Bordeaux, and some others; but it is by no means common in continental hospitals, to the extent which these surgeons recommend. In the Pennsylvania Hospital, of this city, the water-dressing is not unfrequently employed, and is believed useful in many cases.

Were not our space already so largely pre-occupied, we might profitably cover many pages with an account of the contributions of water to this branch of the healing art. But has not enough been said? We may simply refer to Macartney's treatise on inflammation, if not to almost all surgical works, for the details, for arguments, for cases, of which many have been given, of fractures, wounds, dislocations,†

* For Percy's own estimate of this treatment, see Dictionnaire des Sciences Médicales, article *Eau*.

† E. g. the warm bath before reducing dislocations. In treating

&c., where the advantage of this means variously applied, has been undoubted. Besides the cold water dressing and a variety of ingenious apparatus for irrigation of different parts, Dr. Macartney thinks highly of the application of *steam* at different temperatures, to many ulcers, wounds, &c. His favourite theory is, that open wounds may be made to heal *without inflammation*, and without coagulable lymph or granulations. There is much plausibility in his ideas with regard to *poultices*. A poultice, says he, "imbibes the pus it serves to create, and thereby becomes more irritating. A poultice,* before it is many hours on, is a mixture of sour farinaceous substance, rancid oil, and pus, oppressing the part by its weight, and beginning to adhere round its edges to the skin, creating the sense of constriction." He contrasts this with the state of feeling which arises after the poultice is taken off, and the wound or ulcer bathed for some time in tepid water, and with the effect of the water dressing in preventing or diminishing the secretion of pus. A long list of its applications is detailed; great lacerations, punctured wounds,

fractures, Dupuytren, Amesburg, &c., caution against too long continuance with cold applications, after the indication for them has ceased, as tending to prevent complete union and consolidation of the bone. The occasional efficacy of dashing cold water to reduce strangulated hernia, has been already noted.

* A similar opinion is expressed by Dr. A. Billing in his "First Principles of Medicine;" at least so far as to prefer the water dressing.

some frightful injuries being instanced; contusions, sprains of joints, gun-shot wounds, &c.; after division of varicose veins, very successfully; boils, thus completely under our control; inflamed and protruded piles cured so as never to return. Even accounts have been transmitted to him of gonorrhœa being cured by the external application of water to the penis. This may be considered doubtful; although Sir A. Cooper recommends that the penis should be allowed to hang for some time in warm water, as a local bath. In dry and scaly affections of the skin, corns, &c., ganglia in the sheaths of tendons, cartilaginous formations in similar situations, he thinks may be removed by this means. He has never seen tetanus come on when wounds, however severe, and otherwise likely to produce it, were healed under water dressing. Baron Percy remarks, "that if it were possible on the receipt of a gun-shot or other serious wound of the elbow, knee, foot, &c., to keep the part for the first ten or fifteen hours plunged in water, we should have fewer amputations to perform, and we should save the lives of a greater number of wounded."* Also a single case may be quoted: "A lady fractured her tibia close to the ankle joint; great tension, swelling and pain immediately followed. At her own suggestion the limb was placed in a bucket of warm water, which had the effect of removing the pain,

* The water dressing has also the approbation, although with less enthusiasm, of Hennen (Military Surgery, p. 66-67.)

and almost all the tumefaction, before I visited her, for the purpose of adjusting the fracture." Dr. Bell calls attention to a paper by Dr. Tillet, of Lancaster, in vol. ix. of the N. Am. Med. and Surg. Journal, as containing interesting information on this subject. This elicited many others, in the same and other journals. For practical instances of the trial of some of the above-named applications, it will suffice to refer to a series of reports in the Med. Examiner, of accidents treated in the Pennsylvania Hospital, especially in the year 1838, (e. g. Aug. 1), also October 19th, 1839, &c.

It is curious what a diversity of opinion there is as to the treatment of *burns*. Dupuytren, it appears, has thought that it was of great consequence to prevent the developement of inflammation ; and Cooper, (Sir A. C.'s Lect. on Surgery, vol. iii. p. 655), asserts this doctrine to be the one generally adopted at the present day, but that it does not agree with one adopted half a century ago, by B. Bell; who remarked that there was less pain when vesicles appeared, than when they were hindered from rising by cold or other applications. Sir James Earl is said to have been a strenuous advocate for the use of cold water, or rather ice; but the remedy is an old one. Rhazes, Cooper observes, directs that in recent burns, cold water should be applied as soon as possible to the part, and renewed from time to time. And Avicenna says that the formation of blisters is thus often pre-

vented. Cooper approves of the practice in a great number of instances, but with caution, as, where the burn or scald is extensive, *shivering* is apt to come on, and would be increased by such means. Watson relates a case where only an arm was scalded, and immediately plunged into cold water; it was obliged to be taken out, as severe rigors were brought on.

In the Pennsylvania Hospital a number of years ago, Dr. J. Hartshorne treated two similar burns* by the two opposite modes; one with cold water, the other with basilicon ointment, &c.: the recovery of the former was considerably the more rapid. But, perhaps, on the whole, there is almost as much evidence in favour of the efficacy of cotton, as of cold water, in relieving the pain, and preventing inflammation.† They may be combined, as by applying bladders of ice or water over cotton on the part.

A word or two more, before concluding this part of the subject, may be said of some experiments by Dr. J. Davy (Physiol., &c., Researches, vol. i., p. 348) on the action of water in controlling *hemorrhage*. Having his attention drawn to the "aqua Binelli," a quack preparation, said to be a powerful styptic, and suspecting it to be nothing more than common water, with a little naphtha or something

* They occurred in the two feet (one in each) of the *same person*.

† The experience of Dr. J. Hartshorne, is decidedly in favour of cold water as the *first* application often sufficient without any thing else, but in many cases to be followed of course by other means.

similar, he resolved to test this supposition. He divided partially, transversely, the carotid arteries of three dogs, at different times, and then applied compresses dipped in common water and secured by bandages. These were left on for some time undisturbed. Two got well without any injury, but one died, perhaps from the effects of profuse hemorrhage before the compress was applied. In one of those which recovered, the bandage was at first applied too tight, and did not suppress the bleeding until it was removed, and reapplied *not tight*. "The general result of these experiments," says he, "(if I may be allowed to speak so of so small a number) are not without interest in application to surgery." He lays stress on the application of pressure,—*moderate* pressure,—"not too tight," as he found best in these cases, "believing that the virtue of the means consists in the pressure, of course, not in the water, excepting so far as it renders the compresses better fitted for adaptation to the wound, to produce the degree of resistance requisite to counteract the heart's impulse on the vessel, and also better fitted to exclude atmospheric air." This explanation is doubtless correct; but these latter effects are nevertheless of importance. It is this adaptability to our ends, by fulfilling *common indications*, apart from any "virtue," or any "specific action," that renders water so universally and decidedly a useful agent.

We may now bring to a close this brief and cur-

sory, though tedious, resumé of its applications; and once more must we reiterate our *design* as apology for the profusion and length of quotations, and for the display of *names*, which might else have the air of pedantry. We would prove, by instance and citation, for which no very laborious degree of research is necessary, how *largely* the profession have made use of that remedial element, the asserted *new* employment of which, in one mode only of its Protean applications, is the boast and support of a set of medical pretenders. Has not enough been adduced to sustain the assumption with which we began,—that as no element is more essential in health, so none can be (and we now add, *has been*) applied to so many therapeutic uses as water. We might conclude the summary in the words of one, certainly not least in authority among the orthodox worshippers in the temple of medicine, we mean Hoffman. He avers of water, that "in omnibus individuis, omnibus morbosis affectionibus, tam internis quam externis, acutis et chronicis, tam incomparabilem afferat opem ut nulla alia medicina huic aequi-parari possit."

CHAPTER X.

Termination of the subject, with Remarks on the German "Water-cure."

Leaving then the main part of our premises, we approach more nearly to the conclusion, with the assertion that Hydropathy is a delusion. In view of the whole tendency of what has been already said, we need not now add any elaborate argument upon this. A very few considerations will suffice to complete the proof of the entire absurdity and injurious nature of the system. If these are principally of an *a priori* nature, it is to be answered that such must also be any that could be opposed to them in its defence; for the *time* of its *duration* could not yet be sufficient, in any case, to establish it on the firm basis of experience.

And first let us indulge in some general retrospective reflections. Universal as the employment of water has been shown to be, I can find in the history of medicine nothing which could be said to resemble, *in its extent*, the theory and practice of this sect. If we except the sources of certain mineral waters in occasional very high repute, no "hydropathic esta-

blishment" was ever sustained before that of the peasant Preissnitz at Graefenberg. Celsus, indeed, might have given him the hint, were it not that he (Preissnitz) is versed in *none* of the wisdom of the schools. A part, at least, of his course of treatment he might find precedent for in that author's works. "When the fever has reached its highest increment," he, Celsus, says, "preceded by great thirst, cold water must be given copiously, that he may drink even beyond satiety;" "and when his stomach is replete beyond measure, and sufficiently cooled, he ought to vomit (vomere debet). Some physicians do not insist upon vomiting, but prescribe cold water only, and that given to satiety by way of medicine. When either the one or the other of these has been done, he must be covered with plenty of clothes and laid in a favourable position for sleep," "by means of which a general diaphoresis is effused, and that is accompanied with immediate relief." And again, his treatment of hydrophobia, perhaps still more striking, *hydropathic* through and through. For this, he observes, "there is one remedy; that is to throw the patient unexpectedly into a pond, and, should he not have the knowledge of swimming, to permit him to sink occasionally, in order that he may be compelled to drink; sometimes to elevate him; if, however, he can swim, to press him down sometimes, that though unwilling he may be satiated with water." Truly no small resemblance must exist be-

tween this and the condition of the victims of the blanket, in which they are wrapped "precisely like a mummy," and entirely too close to turn, much less escape, while gallon after gallon of the cold fluid is poured down their throats. A work of 1788, remarks, that at that time, "all over the continent of Europe dilution is a very fashionable practice; but the Spanish and Italian physicians carry it farther than those of any other country. Their Diæta Aquea consists in avoiding every kind of diet or drink but simple water, which, after diseases have continued a week or longer, it is to be administered to the amount of eight or ten pounds, for several days successively, in small quantities at a time. This they frequently prescribe to be taken warm, but more generally cold, and, in hot weather, sometimes to be cooled with ice." This, however, is moderation itself compared with what is now done.*

The one sole weapon of the system of Preissnitz is the alterative action of cold water in immense saturating quantities, conjoined at times with external means of compelling perspiration. That there *is* alterative power in such a course, no one can deny. Any disturbing agency, any thing that without vital injury produces a strong impression on the frame, is alterative in its tendencies; that is, by the new action

* *Another* precedent might be found in the world-renowned practice of Dr. Sangrado, in Gil Blas. He, however, had the discretion to add bleeding, though his *warm* water would hardly "go down" so well as cold.

introduced it tends to produce a *change*, to subvert such trains of association as had existence in the body before. But then, the great questions are, how far is this power available in our hands, how far can it be kept under our control, and, is it of such a nature as to be *alone sufficient* in our treatment of disease; a substitute for all pharmacy, and all surgery, a whole Materia Medica in itself? If the latter query alone be answered in the negative, our point is gained; for what right has any mode of treatment to give rise to a sect, if it is only one among a thousand means employed? And how can any other than a negative answer be imagined? Is it possible, we would ask, that the established system, which embraces within itself *all* that is known, all that is good of all systems, all that has been gathered in all countries, and in all centuries, from Hippocrates, down, is to be out-valued by a mere theory—or worse, a mere empiricism, and that of to-day, flying in the face of the accumulated wisdom of a whole scientific world, observing, acting, recording, and acquiring? The herbs which have been conned, and whose properties have been taught with so much care, the roots which have been the strongholds of so many practitioners, the minerals which have formed the rock of their support, are they all, with the lancet, to be washed away by this torrent from the German mountains, to form one universal maelstrom of wrecked science?

"What dreadful noise of water in mine ears!
What sights of ugly death within mine eyes!

———A thousand fearful wrecks,
A thousand men that fishes gnawed upon."

That Scudamore, and other men of real ability and medical acquirements, should perceive the existence of a degree of alterative energy in the hydropathic treatment, and even should suppose it applicable to some cases, is not strange; but what is difficult to conceive, and shall we say difficult to *excuse* is, that any should *give themselves up* to such a practice, on the ground of its supreme or sole efficiency.

For a clear statement and at least sufficiently high an estimate of the real capacity of the course of treatment in question, we may refer to a late number of the Lancet, (Feb. 17, 1844.) In a series of dyspeptic and nervous disorders, occasioned by town life, and in "engorgements of the fibrous tissues of the joints" occurring as sequelæ of gout and rheumatism, this writer believes that, aided by diet, exercise, early rising, it is "calculated to be beneficial." Yet, during an acute attack of gout or rheumatic fever it must be according to the experience of ages, "very far from harmless." And in the cases where it is thought otherwise, much is justly ascribed to the strict hygienic regulations which, with the dictatorship always given to quacks rather than to regular physicians, Preissnitz or his imitators can enjoin, and to the influence of healthy situation and retreat from business, anxiety and excitement. Yet, something also for good and for evil is allowed to the medica-

tion itself. He even admits the "*innocuity* in *some* diseases" of the cold bath, as used by hydropathists, immediately after profuse sweating, brought on by wrapping closely for an hour in a blanket. This concession is at least of questionable propriety. There are, it is true, some facts and arguments which might be thought in some degree to favour it. The mode of action of different circumstances in influencing the effects of external heat and cold on the body, is most difficult to understand; every now and then anomalies present which appear to throw all our previous suppositions from their basis. For instance such cases as the following, from a work which has been already repeatedly quoted. A boy "with a considerable *cough* and febrile heat," played the truant one evening in February, 1797, and passed the whole night walking or sitting in the streets. The night was the coldest of that season; the thermometer at seven o'clock the next morning stood at 10° below the freezing point. The boy's complaint, says Dr. Hamilton, "was somewhat alarming, and I felt considerable uneasiness lest it should increase, from his being first heated, as I presumed, by play, and then suddenly cooled by the frost. The next morning, on his return, I watched him narrowly, as I apprehended a fever might be the consequence of his midnight ramble; but here I was agreeably disappointed; for, in place of fever, his catarrh was cured: his cough ceased, and never afterwards re-

turned." But can such cases, even though fifty of them had occurred, be taken for any thing but mere anomalies?

With regard to the treatment itself at Graefenberg, we have the statement, amongst others, of M. Gross, who visited the spot as a patient. He speaks of some actually pleasurable effects, and explains the safety of the sudden passage from heat to cold, which he says, "experto crede," by the distinction between *active* and *passive* sweating. The former, produced by violent exercise, he asserts, cannot without danger be checked by the cold bath, while the latter may. Now common experience and testimony, it appears to me, would lean considerably towards the *contrary* conclusion. The time when we should expect safety in the action of cold, is when the calorific movement is so high and especially *active* as to resist its effect, and almost, in some cases to maintain the perspiratory process in spite of it. This is instanced by the results of the cold affusion, *only safe when the action is very high*, as in scarlatina; though to be sure the more cautious never try it while perspiration is great, under violent exercise. Currie gives two examples of young men who, in the midst of a journey on foot, although perspiring, took, with entire immunity, a bath in a river; while the next day, after hours of rest, the same attempt was followed by injurious, almost fatal consequences. Having never *experienced* the action of cold immersion after the Graefenberg preparatory

process, we cannot say how far the "action" produced by sweating one or two hours in a blanket is calculated to resist the depressing influence of the bath; but we can only believe the experiment most hazardous, and cry, "Procul, oh! procul este!" to its approach.

Another characteristic of this system, is the averred necessity and expediency of what is called the *crisis* in diseases, produced by the water-cure. Physicians often hail as favourable omens the appearance of certain sores, as about the mouth, or sometimes of eruptions, &c., over the whole body; but who among them, in these, if in any days, would set himself deliberately to work to *create* a boil, an abscess,—"all the symptoms of fever,"—so often, when *spontaneous*, the triumphant enemies of his skill?

The medical world, it is true, is now veering back from its extreme solidism to something more like the golden medium, embracing some of the features of the humoral pathology; but never, we trust, will its *reasoning* portion melt down into such an intense perversion of it as is seen in the views of these *natural-born* practitioners. Let us illustrate by an example; it is taken from a report of the water-cure by Dr. Graham, of which we have been able to see only a review (in Johnson's Med. Chirurg. Review). "Miss S. S———, aged 18, fair and most beautiful, in excellent health, and rather plump, accompanied her parents to Graefenberg, 'on a trip of pleasure.'

Having caught some of the enthusiasm of the place, she determined to make well better, and took to the water-cure, gently at first. For a time, the cold bathing, the mountain air, and other auxiliaries, appeared very pleasant to the neophyte," and she went through the whole course. Her parents left her at Graefenberg to get rid of the "bad stuff" in her blood. In the course of a month feverish excitement set in, the glands of the neck swelled, and boils made their appearance. These symptoms were hailed as the harbinger of *the crisis*, and the expulsion of the "bad stuff." The sweating process was therefore put in practice. After various details, among which is, that "while in the bath as well as in the moist sheets," she complained of pain in her stomach; and even after which Preissnitz declared, that in six weeks she would be *perfectly well*, the case becomes still more threatening. "Having been seized with a violent shivering and cramp in her stomach while under friction in the half-bath, she insisted on being taken out; at which Preissnitz, when informed of it, became very angry, and the next day sent one of his own women, with strict orders to prosecute this operation until she became warm." Finally the end approached. "The moist sheet and the half-bath were persevered in twice a day until within two days of her decease. During the last three days she *vomited blood.* No other remedies were employed to relieve the patient, and none to sustain life. On the

night of the second day after the discontinuance of this treatment, this hapless young lady expired in the arms of her attendant, whilst being raised in bed, the blood at the same time gushing from her mouth and nostrils." On dissection the whole alimentary canal was found to be "in a high state of congestion." "Something *gave way* in her inside," was the phrase by which this modern Galen explained her death! Five other fatal cases are related, and these by one who professes himself a friend to the system, with modifications. Well might its founder acknowledge that "it requires a great deal of strength to go through with it." Two more remarks, by way of summary, may complete our view of its absurdity. 1. Preissnitz and his followers confine themselves almost entirely to the use of *cold* water. The folly of thus discarding many of the most useful modes of applying their own panacea (as the warm bath, vapour, &c.) is gross and palpable. 2. Much of their treatment is *universal*, without regard to diagnosis or pathology. Be the disease what it may, he who goes to Graefenberg must do as Graefenberg does. One instance of this will suffice. "*Tous les malades à Graefenberg* font usage de la fomentation stimulante* appliquée sur la région du ventre. Elle consiste en une pièce de linge, &c., &c., d'accroitre

* The *stimulating* quality residing in the linen itself, with the water which moistens it, acting by confinement of transpiration, &c., "d'accroitre la chaleur du ventre."

la chaleur du ventre et de favoriser la digestion, d'ou résulte la formation de meilleurs sacs. Elle remédie aux, &c., &c., &c." (Bigel, Man. de Hydropathie, p. 111.) It is useless to enlarge farther upon these points. They force the conclusion, that the hydropathists, however some of them may plead *want of learning* as proving the contrary, are mere theorists, — men with one idea, in common phrase, their hobby; and, this being the case, whatever their doctrine, it and its professors are by no means to be trusted.

Yet their cause is spreading; it is already an enemy worth combating. Threatening in Germany to supersede homœopathy, it has crossed the water into that land which may perhaps be considered in the van of nations. We have seen the advertisement of a "Hydropathic Establishment, Stanstead Bury House, Hertfordshire, by Dr. Johnson, author of Life, Health, and Disease, &c." On our own borders, too, the flood is commencing, by slow creeping, to encroach. Let the dykes of the profession then be raised to meet it; every where let there be reiterated such protests as that of the French Academy. We may quote their words. On mature consideration, at the request of the government, they concluded, "1st, That hydropathy is a dangerous therapeutical method, which does not rely on facts; 2d, That its theory is chimerical; 3d, That it is in disaccord with our chemical and pa-

thological doctrines; 4th, That the Academy cannot in any way approve of it; 5th, That the use of cold water has been long in the domain of medicine, and submitted to rules."

If there be any thing good or new in this system,—if it be found that they *have* added force and boldness *with safety* to a remedy already employed by the profession, in the name of science let it be received; but let all else, and *all* if this be not the case, be urged by all honest means toward the region of oblivion. The true method of defence against new systems of quackery must be, not to deprive ourselves of any useful means, (however trifling, or however injurious when made panaceal,) simply because employed by those who delude, or are deluded; but to show the world, if possible, that all that is good of what they boast is but a mere atom, yet *does exist* as a part of the vast store of our known resources. Every few years some new bubble thus arises, ephemeral, or if surviving the year of its birth, living only on the credulity of the weakest victims; and at last giving way to another with a similar Phœnix life. That such will be the fate of the one which has been under discussion, there can be no doubt, although at present it seems hardly to have reached the meridian of its career.

THE END.

Dr Bell Editor
With the publishers respects

WATER

VERSUS

HYDROPATHY;

OR,

AN ESSAY ON WATER,

AND

ITS TRUE RELATIONS TO MEDICINE.

BY

HENRY HARTSHORNE, M. D.

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